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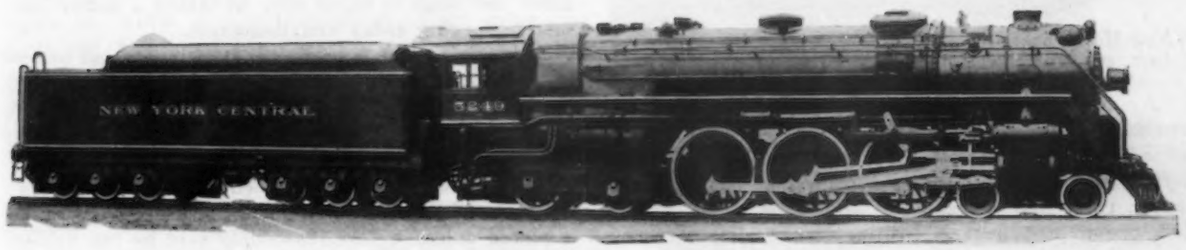

Steels for Locomotive Forgings

Must Be Sound and Clean under Fracture and Deep-Etch Test, Heated with Deliberation, and Finally Normalized and Annealed for Highest Qualities

BY E. J. EDWARDS*

DESIGNING engineers will, I believe, agree that there are few machines built today where the service required of the forgings is more severe than in the modern locomotive, which in freight service may haul a train of 100 to 125 loaded freight cars at 35 to 50 miles per hour. The new Hudson-type passenger locomotive shown in the head piece, furnished by the American Locomotive Co. to the New York Central Railroad in November, 1927, will pull 25 Pullman cars at a rate of 65 miles per hour. Its wheel base is 83 ft. 7½ in., the engine alone weighs 349,500 lb., and it has a maximum tractive effort with booster of 53,200 lb. No more than two or three years ago, the average run was approximately 100 to 150 miles. Today, the modern passenger locomotive is called upon for 400 to 800 miles in one trip.

The American Locomotive Co. has built a new forge and heat-treating plant at Dunkirk, described in detail in THE IRON AGE, Jan. 12, 1928, p. 127, where special care is taken to secure a product that will meet the exacting requirements of the various railroad specifications. While the larger tonnage produced is locomotive material, the shops are in a position to make forgings for other machinery manufacturers in various designs up to 16 in. in diameter or thickness.

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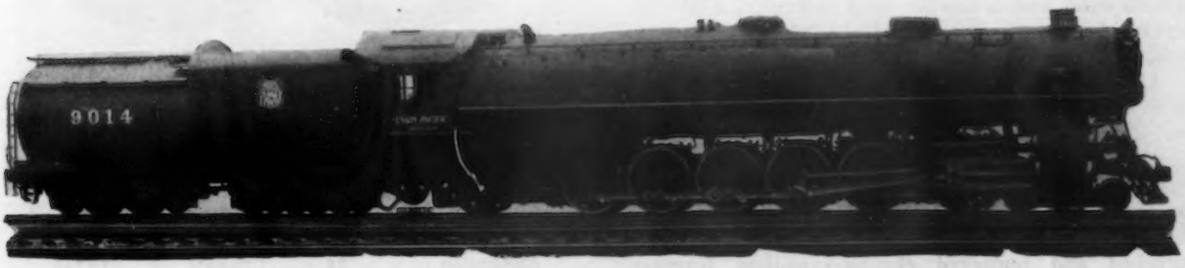
Change from Wrought Iron Brought Many Problems

It should be stated that up to 25 years ago nearly all locomotive forgings were made of wrought iron. Scrap, carefully selected from old rolling stock, with new bars as required, was piled into faggots, heated to welding temperature and forged into billets under a steam hammer. Enough of these billets were then wired together, reheated and rewelded into a piece big enough for the forging required. The piece was then delivered to the machine shop without heat treatment.

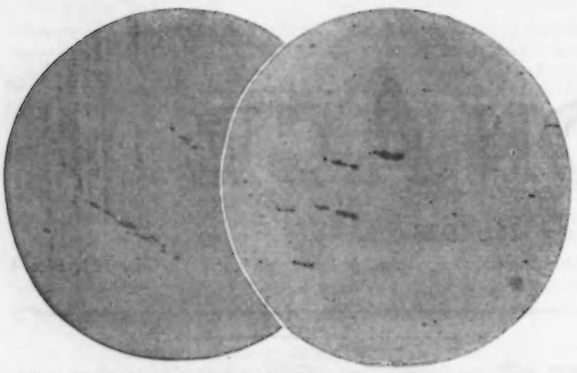
Since that time the demand for stronger and better parts has grown continuously. In 1908 one of the leading railroads specified steel of the following analysis (ladle test):

Carbon	0.35 to 0.50 per cent
Manganese	0.40 to 0.60 per cent
Phosphorus	less than 0.05 per cent
Sulphur	less than 0.05 per cent

At that time little attention was given to check



Above Is a Three-Cylinder Freight Locomotive. Wheelbase, 91 Ft. 6½ In.; Weight of Engine, 495,000 Lb.; Maximum Tractive Effort, 96,650 Lb.



Non-Metallics in 0.52 Carbon Steel Driving Axles. Left, an acid steel; right, a basic steel. Unetched; **60 *diameters***

analyses, the amount of segregation was not determined, nor was it certain that a sufficient top and bottom discard was being made to insure only sound dense metal, free from segregation. Little or no attention was given to the rate of heating the billets, the time of soaking at heat, or the final temperature of forging. An occasional tensile test was made for record purposes but was not used as a basis of acceptance or rejection. A forging made under such conditions was placed in service without ever having seen an annealing furnace. Suffice it to say that a medium carbon steel in such a state was not fit for the purpose intended.

In 1907 or 1908 it also began to be recognized by railroad men that annealing was necessary in order to refine the crystalline structure of the metal. To do this, driving axles were placed into a flange furnace, wherein the flame came in direct contact with the metal. After heating to a cherry red, the axle was allowed to cool in the furnace or in the air. Crude though this practice was, an improvement was seen in the quality of the driving axles and it was not long before the other important forgings, such as rods, crank pins and piston rods, were annealed.

At about the same time forgings in nickel and vanadium alloy steels were made. Such forgings were annealed only. Some of these are, I believe, still in service, but the analysis of the nickel steels apparently was not properly balanced, with the result that such forgings did not find favor.

Late in 1909 or early in 1910 a large number of quenched and tempered chrome-vanadium forgings were made for engines then being built. Results were most disappointing, as a large percentage failed in service. The failures were due to thermal ruptures which were no doubt present in the forging previous to the heat treating, defects which were intensified by the internal strains set up in the quenching.

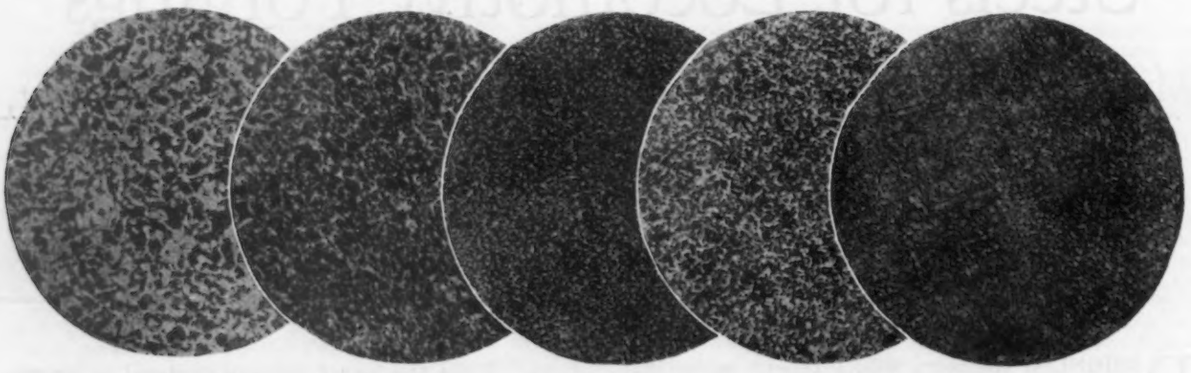
Soon thereafter a considerable tonnage of quenched and tempered carbon steels was specified, but again the service results were disappointing. A large number of failures were attributed to internal strains, set up during the rapid cooling of the metal.

Sound Steel Selected at the Source

The above deals with the past. Let us now consider just what is being done to insure a better locomotive forging today and tomorrow.

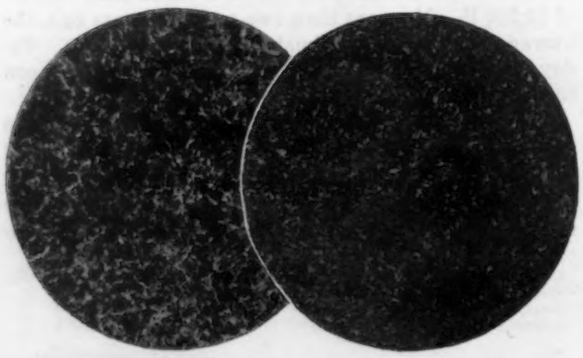
The raw materials used consist of ingots and blooms of steel (and bar iron for the manufacture of such wrought iron forgings as are still required). Before placing an order with a new manufacturer for blooms or bar material, an investigation is made to learn definitely just what he can do when producing high quality material of the requirements specified. No order is placed unless we are reasonably sure he can deliver, and unless he agrees to abide by our inspection methods.

Corrugated ingots of acid steel made in our own open-hearth furnaces at Latrobe, Pa., are used in the



Microstructure of Normalized and Annealed Forgings, All at 60 Diameters

ELECTRIC CARBON STEEL 14-In. Crank Axle		CARBON STEEL 13-In Driving Axle		VANADIUM STEEL 6-In. Piston Rod		CHROME-VANADIUM 10 x 6-In. Side Rod		NICKEL STEEL 12-In. Crank Pin	
C	0.36	C	0.52	C	0.49	C	0.34	C	0.35
Mn	0.56	Mn	0.64	Mn	0.85	Mn	0.73	Mn	1.22
P	0.014	P	0.25	P	0.024	P	0.048	P	0.030
S	0.023	S	0.040	S	0.021	S	0.030	S	0.031
Si	0.42	Yield	52,790	V	0.19	Cr	1.07	Ni	2.32
Yield	45,550	Ultimate	89,780	Yield	61,680	V	0.14	Yield	62,100
Ultimate	81,030	Elongation	24	Ultimate	97,140	Yield	59,440	Ultimate	96,600
Elongation	29	Reduction	37	Elongation	27	Ultimate	98.660	Elongation	28
Reduction	55			Reduction	58	Elongation	25	Reduction	61
						Reduction	53		



Microstructure of Quenched and Drawn Forgings

CARBON STEEL 10 x 6-In. Side Rod		CHROME VANADIUM 10 x 6-In. Forging	
C	0.47	C	0.27
Mn	0.56	Mn	0.58
P	0.010	P	0.022
S	0.024	S	0.024
Si	0.16	Cr	0.88
Yield	57,450	V	0.16
Ultimate	94,900	Yield	91,420
Elongation	28	Ultimate	110,100
Reduction	57.3	Elongation	24
		Reduction	68

manufacture of the larger forgings. This of necessity means that an excellent quality of raw material is used in melting, for it must be remembered that in the acid open-hearth none of the phosphorus or sulphur is removed. We believe that a well made acid heat is preferable to a basic heat, one of the reasons being the smaller amount of slag and dissolved oxides present in the finished steel. Unetched specimens, such as shown on page 256, will bear out this statement.

Specially designed hot tops limit the pipe and draw segregation well toward the top of the ingots. Surface defects are removed by chipping. In making the top discard, the crop is removed by cold sawing, allowing 4 or 5 in. for a fracture test at the very center of the ingot, as shown in the illustration. Each ingot is given an individual identification number; drillings are then taken for chemical analysis as described later. This insures only the use of sound steel and material free from segregation. Should the analysis or fracture show a segregated or piped condition, an additional discard is made in the same manner by cold sawing and breaking until a sound unsegregated steel is discovered. This precaution is in itself a method of inspection rarely found in work of this nature, but we believe quite indispensable if highest quality is to be attained.

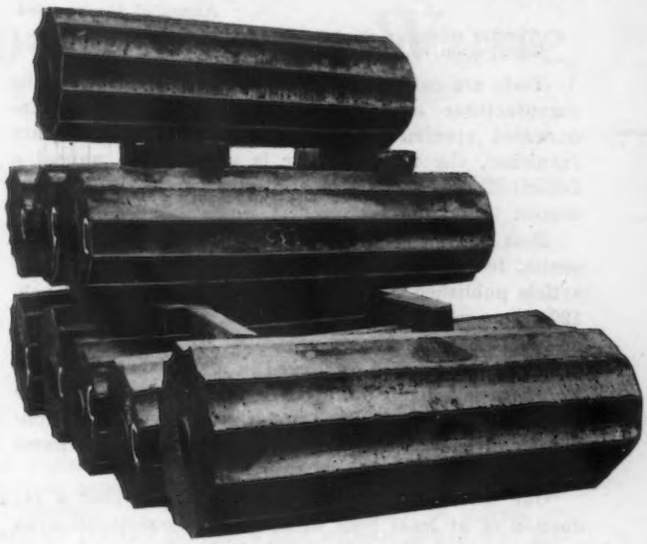
Ingots are charged into cold, oil-fired furnaces, and the heat applied slowly to avoid internal ruptures and to insure uniform penetration of the heat throughout the mass. Forging is done under a hydraulic press of 1000-ton capacity as shown in the previous article.

Deep-Etch Test on Forging Blooms

Most of the driving rods, crank pins and piston rods are made from rolled blooms or billets in alloy steel as well as straight carbon. It is our practice to make full-sized cross-section macro-etchings at the mill on all alloy steel heats. Three specimens, cut from different ingots, two being taken adjacent to the top discard and one from the lower part of the ingot, give a good indication of the quality of the heat. In this connection, it is interesting to note that the American Locomotive Co. was a pioneer in including the deep-etch requirement in a material specification.

As regards the macro-etching (or deep-etch test), it is next to impossible to establish a standard requirement. However, our mill inspectors, who are really specialists in this type of testing, have become sufficiently proficient so that the amount of questionable steel accepted has been reduced to a minimum.

The test has worked out to the advantage of the steel makers, however, who have been able to correct bad practices and thus produce more uniform, higher grade metal. We believe that the deep-etch test is the only one which will detect thermal ruptures produced during casting, reheating or blooming mill work—defects which we know were responsible for hundreds of failures in the harder steels when they were first being made.

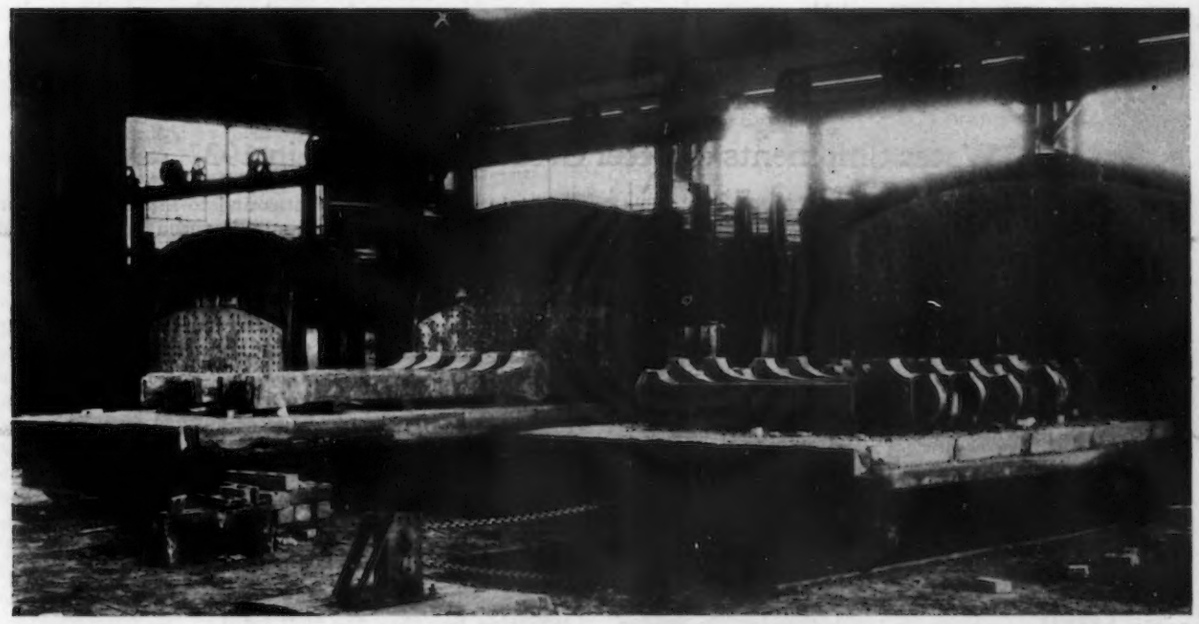


Hot Top Acid Steel Ingots Cropped for Fracture Test at Center

Carbon Segregation Limited to 15 Per Cent

Drillings for chemical analysis are taken from a ⅝-in. hole from three billets adjacent to the top discard and from one or more additional billets close to the bottom, selected at random in each heat of alloy or carbon steel. Samples are drilled half way from center to edge, as well as at the dead center. The analysis at the half-way point must show a composition within the chemical range specified, while the carbon content at the center must not vary more than 15 per cent from that actually found at the half-way point. Acceptance or rejection as regards segregation is based entirely on the check analysis; ladle analysis is reported for record only.

An unusual requirement of the American Locomotive Co. specification for straight carbon steel blooms



Side Rods Ready for Heat Treatment

with 0.40 to 0.55 per cent carbon is that a tensile test be made from one top-cut and one bottom-cut billet in each heat. By "top-cut" billet is meant the section adjacent to the discard from the top of the ingot, while the "bottom-cut" may be taken from any other billet cut further down in the ingot. Minimum physical requirements specified for such tests are as follows:

	Annealed	Unannealed
Tensile strength, lb. per sq. in. ..	80,000	82,000
Elongation in 2 in., per cent.....	18	15

Tests are cut from full-sized cross-sections, and the manufacturer may furnish either annealed or unannealed specimens. When annealed specimens are furnished, the manufacturer is expected to anneal a full-sized cross-section of the billet, and take the test coupon therefrom.

Best heating and forging practice is of course essential to make a good part out of sound steel. In the article published in THE IRON AGE of Jan. 12, 1928, p. 127, the equipment was described whereby the ingots or billets may be heated according to a definite schedule and then pressed or forged in a way that the ingot structure is broken up, even to the very center of the piece. All heating is done under strict pyrometric control in furnaces which prevent direct contact of flame and metal.

Our forefathers handed down a legend that a reduction of at least four to one in cross-sectional area was necessary to produce a desirable forging from a billet or a reduction of five to one in cross-sectional area when making a forging direct from the ingot. An investigation recently conducted by the writer indicates that we can get equally as good results with a reduction as low as three to one from the ingot. This is of vital importance because we all recognize that the larger the ingot the greater is the tendency for segregation.

Heat-Treatment Practices

Forgings, after being allowed to cool in the air, are removed to the heat-treating plant, where they are given the desired heat treatment required to meet the various specifications.

Experience has proved that the straight anneal will not produce a desirable grain structure. Because of the large section represented by a locomotive forging, such large internal strains are developed on quenching that ruptures frequently occur. It has been demonstrated that in order to obtain the better grain refinement (which naturally means better physical properties, especially ductility) and to avoid the terrific strains set up in quenching, it is necessary to normalize and anneal. This more dependable practice is well worth the cost of such a treatment.

The standard practice of the American Locomotive Co., therefore, is to normalize and anneal both the alloy and straight carbon steels unless otherwise specified by the customer. The forgings are treated in oil-fired furnaces, where the flame does not come in direct contact with the metal. The rod or axle is supported on cast iron blocks about 4 in. from the hearth, as shown in the photograph; a little space is also allowed between each piece so as to permit complete radiation around the mass. The piling of more than one tier on top of the other is not permitted. To normalize we hold the forging at the desired temperature a time equal to 1 hr. per inch of thickness or diameter, withdrawing the car and cooling rapidly on the car to a temperature below the critical range. A subsequent anneal at a temperature below the critical is then given to meet the specified physical properties.

To assist in getting uniform structure in heavy masses it is the practice to hollow-bore round forgings; the larger the cross-section the larger the diameter of the hole. A good rule is to have the inner bore one-fifth the outer diameter. This not only promotes uniform heating and cooling, but removes that portion of the steel where physical defects are most often found. Even this expedient does not remove the danger of thermal rupture in quenching a dense alloy steel forging 8 in. thick in the wall.

Testing the Finished Forgings

For testing it is the practice to forge (attached to the forging itself) a prolongation of a sectional area equal to that of the body of the forging. Such prolongations are made on approximately 25 per cent of the production so as to enable the inspector to choose at random those which are to be tested.

A modern laboratory permits complete physical, chemical and microscopical testing.

Microphotographs and the corresponding physical and chemical properties shown in this article are representative of the results being obtained. The size of the rod, axle or pin from which each test is made is also of importance, because while such structures may easily be duplicated in laboratory pieces, it is not so easy to get them in commercial production on heavy masses, sampled half way from the center to the surface.

That the views shown are by no means special may be inferred from a letter recently received from the engineer of tests of a Western railroad. He is one of the few who specify the grain size as determined under the microscope. His laboratory had independently investigated 131 forgings on 35 locomotives delivered during the course of several months, and the verdict was that the uniformity was very satisfactory.

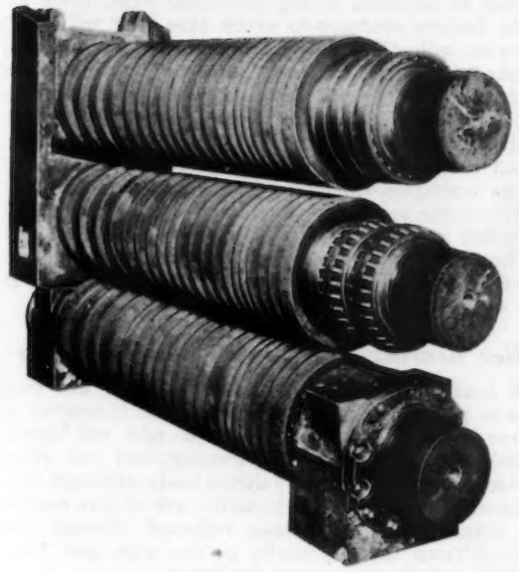
Water Shipments of Steel Greatly Increased in 1927

THE issuance by the United States Engineers' Pittsburgh office of the report of the commerce of the Allegheny, Monongahela and Ohio Rivers within the jurisdiction of that office, for December, completes the record for 1927. Of particular interest to the iron and steel industry is the expansion in the use of the inland waterways for the transportation of its products.

The total tonnage moved in the Allegheny River in 1927 was 2,955,695 net tons, and included 13,867 tons of iron and steel products; of the total Monongahela River tonnage of 24,492,968 tons, the iron and steel item was 689,087 tons, and in the 9,624,134 tons moved on the Ohio River there were 697,262 tons of iron and steel products.

Figures of the Ohio River tonnage represent closely the shipments beyond the confines of the Pittsburgh district and as they pertain to iron and steel are a good measure of the efforts Pittsburgh district steel companies have been making to break through the cordon of high railroad freight rates and to find an outlet for their products beyond the limits imposed by the railroad freight charges.

The total traffic of the Ohio River as reported to the Pittsburgh office by lock-keepers between Pittsburgh and Wellsburg, W. Va., locks beyond latter point being under the jurisdiction of the Huntington, W. Va., office, for 1927 of 9,624,134 tons, compares with 9,306,900 tons in 1926 and 7,647,325 tons in 1925. The 1927 Ohio River total iron and steel shipments of 697,262 tons compares with 315,221 tons in 1926 and 377,403 tons in 1925. The gain in total Ohio River tonnage in 1927 over 1926 was 311,234 tons; the increase in iron and steel tonnages was 382,041 tons. In other words, last year's total gain in Ohio River traffic was supplied by iron and steel. The combined total of Ohio River shipments of iron and steel products for 1925 and 1926 was 692,624 tons, or 4638 tons less than the 1927 total.



Roller Bearings Cut Down Power Waste

As Applied to Roll Necks, Pinion Stands and Hot Saws in Steel Mills

BY S. M. WECKSTEIN*

CONSIDERING the percentage of driving power that is wasted in overcoming friction in the average type of machine used in the production of steel, it is not surprising that the possibilities of anti-friction bearings as applied to this service are of such great importance from the standpoint of operating and maintenance economy. The idea of applying them is not particularly new, but the difficulties in the way, especially in the case of the heavy-duty machines such as rolling mills, hot saws, finishing mills, and similar types were so great, that up until a comparatively short time ago it was regarded as impractical.

About three years ago, however, the engineers of the Timken Roller Bearing Co. started a series of experiments on a large scale, with a view toward developing a type of bearing that would successfully meet all the very exacting requirements of the service. Since the company is itself a large producer of steel, its own plant became available as a laboratory where the bearings could be tested under actual service conditions over any period of time considered necessary to assure accurate and definite information. As a result of these experiments, bearings have been produced for a number of different services, the most notable among them being a type especially suitable for the roll necks of rolling mills.

Since the first development of these bearings, a number of installations have been made in mills of various types all over the country, and results in the way of increased production, decreased operating costs, and improved maintenance economy have been obtained that have more than justified the predictions made for the bearings in the early stages of their development. This is true not only in the case of rolling mills, but of a number of other types of machines to which either these, or bearings of a similar nature, have been applied. Before going into details concerning these results, a description of the bearings themselves and their methods of application should be interesting if for no other reason than because it gives the best idea of the way in which the difficulties and limitations imposed by the service requirements were overcome.

Roller Bearings Suited to Roll Necks

PROBABLY the most difficult application, from the standpoint of mechanical as well as of load requirements, was that made to the roll necks of various types of rolling mills. However, as can be seen from Fig. 1, the bearing as actually developed for this purpose is exceedingly simple, both in construction, and as concerns the mechanical operations necessary to install it. It consists essentially of two double cones or lower races, four sets of tapered rollers with individual cages, and three cups, one of which is double. The assembly is a simple three-part operation, the cups, cones, and rollers being all assembled inside the bearing chuck. Therefore, the complete assembly may be slipped on and off the roll neck as a unit without in any way disturbing the bearing adjustment.

Since the projected area of the two double cones is nearly equal to that of the roll necks, the unit pressure per square inch permits a loose fit of the cones on the neck without any danger of chafing. By virtue of this construction, not only is the assembly of the rolls in the mill rendered a simple matter, but their removal, or the removal or replacement of a bearing, is also facilitated.

While this is especially true in the case of new mills, which can be designed with particular reference to this type of assembly, it is also true of such existing mills as lend themselves to an anti-friction application. No great modification in construction is necessary in such cases to permit the replacement of the bearings formerly used by the new roller bearing. Fig. 2 shows a typical method of mounting the rolls in the mill.

Another interesting feature of these bearings is their compactness. Their width has been kept well within the limits imposed, without any sacrifice of their ability to withstand any of the radial or thrust loads likely to be encountered in service. With regard to the latter type of load, experience has shown that the thrust capacity of the bearings is such that they can easily handle the maximum peak thrust loads met with.

The construction of the bearing has permitted the

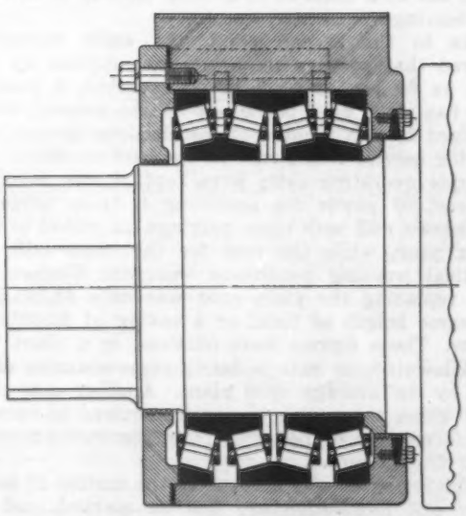


Fig. 1—Section of Chuck and Bearing Developed for Use on Roll Necks

*Industrial equipment engineer Timken Roller Bearing Co., Canton, Ohio.

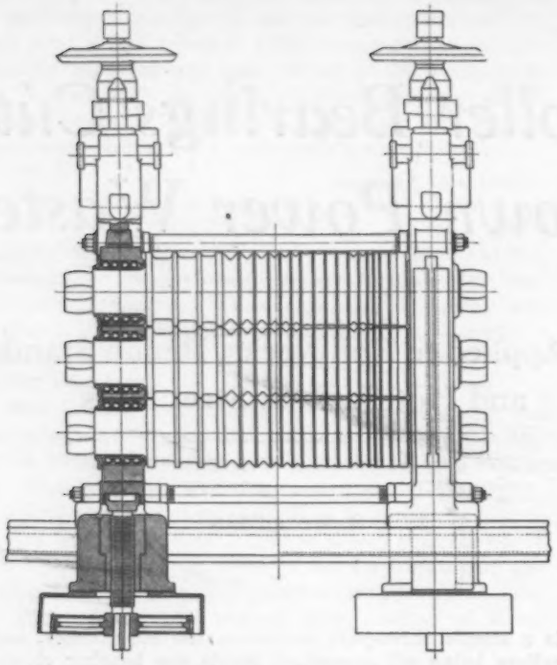


Fig. 2—Typical Application of Bearings to a 3-High Rolling Mill

incorporation of yet other features that add greatly to its effectiveness from a service standpoint. The chuck can be designed so as to form a practically grease-tight inclosure around the roll neck itself, with the result that grease can be forced into the assembly until the pressure becomes such as positively to prevent the entrance of either water or scale into the bearing or housing. The same holds true, of course, in the case of dust or other foreign matter that may be deposited on the housing from the mill atmosphere. As a result the necessity of frequent inspections or renewals of the lubricant is eliminated.

Some of the Advantages Claimed

The advantages obtained from the use of these bearings may be listed in the order of their importance: Improved continuity of service, considerable saving in power consumption, and decreased lubrication and maintenance cost. With regard to the first, experience has already proved that not only are the delays from shutdowns due to bearing failures or troubles materially decreased, but the machines can be worked steadily over longer periods of time without the necessity for inspecting or rehabilitating the bearings. In fact, the frequency with which the machine is out of service for any such cause becomes a matter of how often the rolls must be re-dressed instead of how often the bearings need attention.

As to the second point, the early experiments showed that savings in power consumption up to as high as 60 per cent might be expected, a prediction that has since been borne out by the average savings obtained from a number of installations having widely varying service conditions. In one case on record where accurate operating costs were kept, it was found that the cost of power for operating a 16-in. three-high, breakdown mill with plain bearings amounted to $8,029 for a year, while the cost for the same mill under identical working conditions, but with Timken bearings replacing the plain ones was only $4,335.66 for the same length of time, or a saving of $3,693.34 for power. These figures were obtained in a plant where the kilowatt-hour rate is fairly representative of that paid by the average steel plant. Another case can be cited where the saving in power required to operate a mill formerly equipped with plain bearings amounts to about 62 per cent.

The improvements claimed in the matter of maintenance and lubrication are just as marked, and have been equally justified by the results obtained in practice. Concerning the former, while conditions in various plants vary to a degree that prevents the making of any definite statement as to the percentage of saving that can be expected in any particular case, there are certain factors common to every case that will serve to give an indication of where some of the savings may be looked for. For instance, the costs for babbitt and that for the labor required to re-babbitt plain bearings are totally eliminated and, as has already been intimated, it is a much simpler matter to handle the bearings off and on to the roll necks, so that labor costs for this operation should be less. The same difficulty of determining percentage savings exists in the case of lubrication cost, and for the same reasons. It may be said, however, that results indicate that the comparative ratio seems to be of the order of one to ten, in favor of the roller bearing.

Roller Bearings for Pinion Stands Simpler

THE load characteristics of pinion stands are such as to permit the use of a bearing that is simpler in construction than that designed for mill roll necks. Not only are the radial loads smaller, and less given to sudden high peaks, but the thrust loads, although they are somewhat the same in character, are of less magnitude, being principally those reflected through the couplings from the roll necks on one side, and from the speed reduction gears on the other.

The bearings used in this case may be either of the single or double type, depending on load conditions. That is, they may consist either of a single cone, tapering toward a central apex, two sets of rollers and cages, and two individual cups, one for each set of rollers, or of two double cones with four sets of rollers. One method of mounting is shown in Fig. 3. The same simplicity characterizes the mechanical details of mounting as that described in connection with the roll neck bearings, with the addition that the construction of the chuck or housing may be even simpler because of the lighter service requirements.

Conditions for Hot Saws Hard to Meet

LOAD characteristics of hot saws are such as to make the bearing requirements of this class of equipment very difficult to meet. In the first place, the high speed of the saw, coupled with the fact that heavy peak loads are imposed with great suddenness, requires that the saw arbor be very rigidly held with regard to either vertical or horizontal movement, because otherwise the severe thrust loads imposed by the natural whip of the saw blade under load would be increased out of all proportion, and the saw blade itself might be destroyed.

In the second place, the operating temperatures are high enough to exert a decided influence on the performance of the saw. Owing to the construction which must be employed, it is unavoidable that enough heat to

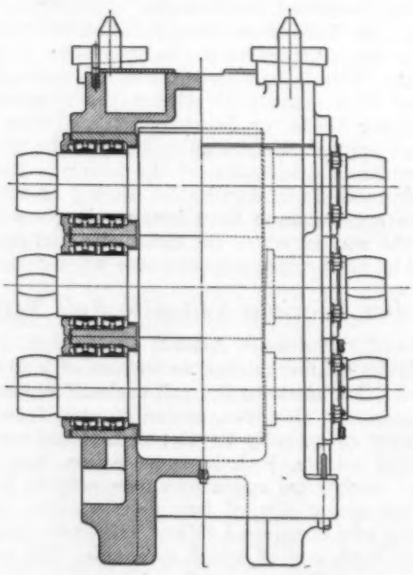


Fig. 3—Method of Applying Bearings to Pinion Stands

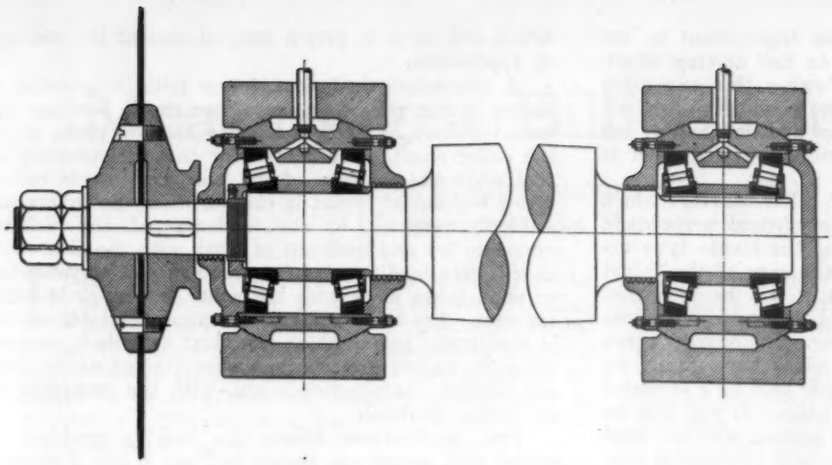


Fig. 4 — Typical Mounting of Bearings on a Hot Saw

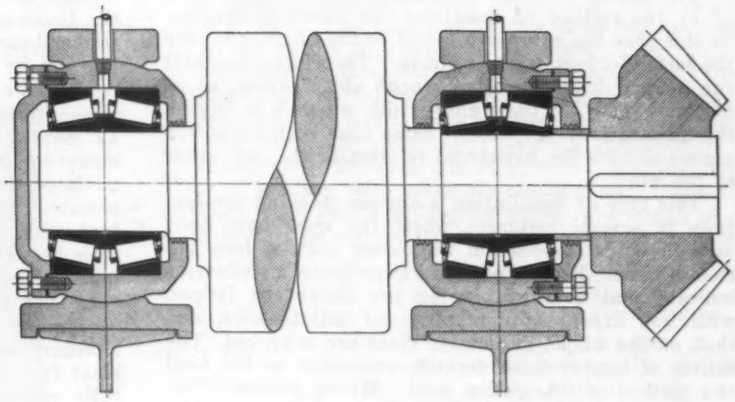


Fig. 5 — (At Right) Typical Mounting for Mill Table Rollers

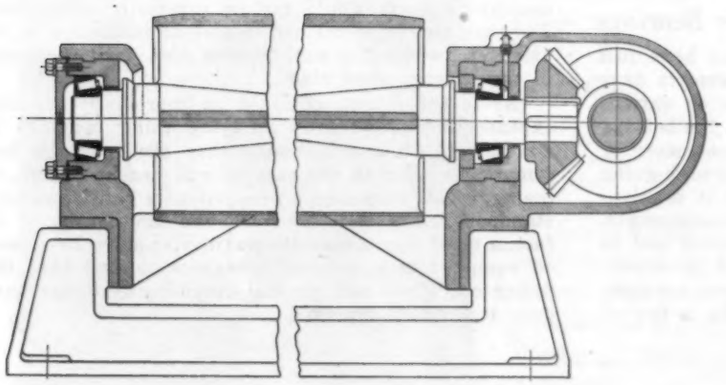


Fig. 6—(At Left) Single Bearing Mounting on Table Roller

Fig. 8—(Below) Indirect Mounting on Hot Bed Table Rolls

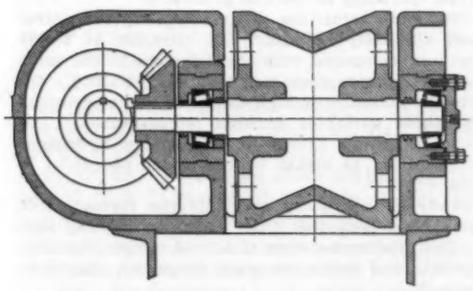
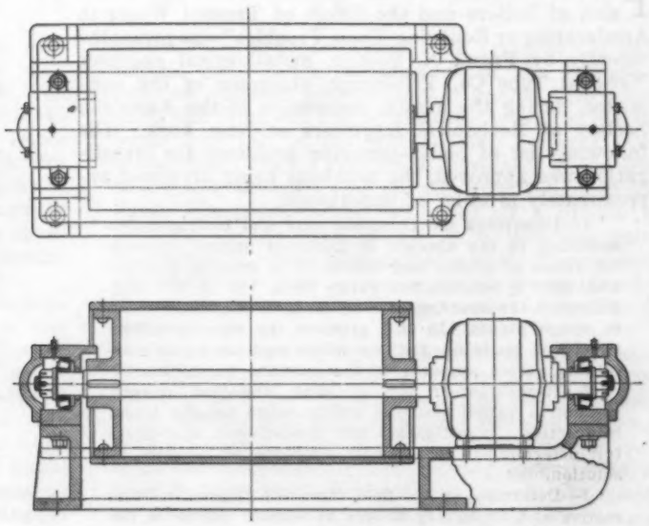


Fig. 7—(Above) Bearing Mounting on Tube Mill Table Roller



cause material expansion will be transmitted to the saw arbor proper, and thence to the driving shaft. Provision must be made for allowing this expansion to take place without affecting the rigidity with which the saw arbor is held. Heat in addition makes the lubrication problem somewhat more involved than is ordinarily the case.

A typical mounting of tapered roller bearings which has been developed to meet these conditions is shown in Fig. 4. The bearings used are of the single type arranged with opposed tapers to take care of the thrust loads. By examining the layout it will be seen that every precaution has been used to insure absolute rigidity at the saw end of the arbor. The bearing cones are a press fit, and are held in place horizontally by spacers. The outside cone is further held by a threaded nut that clamps the assembly in place. It will also be seen that the construction of the housing and end caps is such as to provide for a circulatory lubrication system.

The matter of shaft expansion has been taken care of by the method of installing the outboard bearing. In this case the cones are keyed to the shaft, allowing the latter to float in the bearing. Therefore, the shaft can expand longitudinally through this bearing, so as to compensate for the rigidity with which it is held in the inboard bearing. At the same time such expansion cannot disturb the horizontal relation of the saw arbor to the work.

This type of installation is already working successfully in several instances where the saws have been used in actual production work over quite a long period of time. Results obtained from these installations indicate that average bearing life should be longer, with less expense for repairs and maintenance, and that, on the whole, lubrication costs are improved. The degree of improvement depends somewhat on the kind and method of lubrication used. Where grease is the lubricant, the ratio is about one to ten in favor of the tapered roller bearing, and even where oil is used, the improvement is of a material character.

Auxiliary Equipment Can Use Roller Bearings

IN addition to the major machines, which have just been described, several bearing arrangements have been developed which are suitable for use on various types of auxiliaries. As in the other cases, the bearing arrangement for the different types has been more or less conventionalized, as a result of thorough-going studies of load conditions and service, but it is adaptable to modifications to meet special requirements. Of the auxiliaries, the ones lending themselves best to bearing application are the table rolls used in connection with the various types of mills. Several arrangements have been developed for various rolls, a few of which will serve to give a general idea of the methods of application.

A characteristic layout for a mill table roller is shown in Fig. 5. In this case, two single bearings are mounted back to back, the cones being a press fit on the roller shaft. The reason for this arrangement is, that while the majority of the load is of course radial, a fair amount of thrust is caused, when the rollers are suddenly reversed, by the tendency of the driving pinion to try and back out of mesh with the side shaft gear. This condition is of course aggravated when the reversal takes place with the roller loaded, as is often the case. The bearing layout for approach table rollers is practically the same as that just described, because since the rollers are nearly always started under load, the loading characteristics are, with the exception of reversals, identical.

Two applications where the bearing problem is solved very easily are shown in Figs. 6 and 7 respectively. In both these cases the loads, both radial and thrust, are very much lighter, and the construction of the bearing supports is such as to more easily assure proper bearing alinement—consequently, a single bearing can be used.

In the case of the hot bed table rolls for strip mills, a mounting similar to that shown in Fig. 8 is suggested as good practice. The indirect method of bearing mounting is used, that is to say, the bearings are so mounted that a slight expansion of the table rolls, and possibly of the housing, due to heat radiation from the load, will cause the bearing cones to move axially away from the cups, and eliminate the possibility of the bearings seizing. This method of mounting has proved very successful in service.

Similar applications have also been made to other auxiliary equipment such as tilting transfer tables, blast furnace bull wheels, straightening machine idler rolls and piercing mill holding chucks, to give a few examples. Since both the load characteristics and the bearing arrangement in most of such cases would merely duplicate those already described, particular details concerning them would not be especially interesting. They are merely mentioned to give an indication of the extent to which the anti-friction idea can be carried in the average steel plant.

As to the results obtained in improving operating expense and practice by applying roller bearings to auxiliaries, while individually they are naturally less remarkable than in the case of roll neck bearings, in the aggregate they show a proportionate gain from both standpoints, and for very much the same reasons. In fact, a plant where even the auxiliaries alone have been so equipped may reasonably expect to find that the power conditions and general operating economy have been materially improved.

Boiler-Corrosion Problems

PROGRESS report of sub-committee No. 5 on "Corrosion of Boilers and the Effect of Treated Water in Accelerating or Relieving These Troubles" was presented recently by Frank N. Speller, metallurgical engineer National Tube Co., Pittsburgh, chairman of the committee, during the annual convention of the American Society of Mechanical Engineers at New York. The following list of boiler-corrosion problems for investigation was approved, the problems being arranged approximately in order of importance:

1—Determine the corrosion rate and hydrogen-gas evolution *in the absence of* dissolved oxygen through the range of acidity and alkalinity in general practice and with a temperature range from 140 to 450 deg. Fahr., on the heat-transfer surfaces of the water cycle in steam plants. In this problem the determinations should be made on distilled water and on water containing varied amounts of the common impurities.

2—Repetition of No. 1, with dissolved oxygen present in varied amounts within range usually found in practice. Investigation and development of method for determining very small amounts of oxygen in solution.

3—Determine in the field dissolved oxygen in locomotive and stationary boilers at various points in the circulating system. Include boilers of various types. The field tests on boilers should include some of the same type operating at various pressures.

4—Study the variations in hydrogen-ion concentration, and alkalinity of acidity by titration at boiler temperatures, compared with these factors in the same water at normal temperature (68 deg. Fahr.). Investigate the influence of high concentration of common salts on these variables at high temperatures. An automatic recording device for measuring hydrogen-ion concentration in steam boilers under operation is desirable.

5—Study in laboratory and field the formation of protective films deposited from water on heating surfaces. The relation between dissolved oxygen, alkalinity, chlorides and protective scale formation should be investigated.

6—Study pitting found under boiler scale, particularly in locomotives operating in certain geographical sections.

7—Electrolytic prevention—cause and effect.

8—Corrosion in boilers, caused by organic materials.

9—Study action of inhibitors (organic and inorganic) at boiler temperatures.

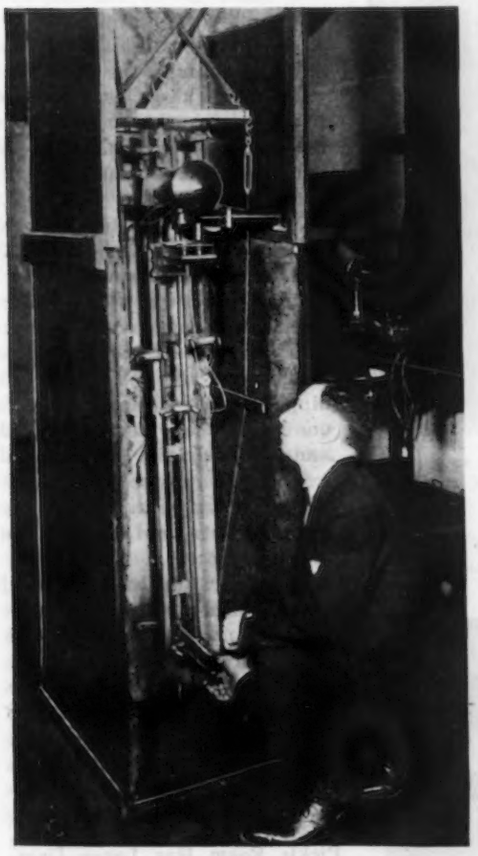
The sub-committee appointed to study plans for an experimental boiler to be used in carrying out certain parts of the boiler-water studies has been at work, but has not yet made a final recommendation.

Measuring a Billionth of an Inch

Device Required to Study Changes in Length of Permalloy—When Magnetized Has Extreme Sensitivity

EQUIPMENT to measure changes in length of the order of a billionth of an inch has recently been devised by P. P. Cioffi of Bell Telephone Laboratories. If it were possible to get paper so thin, over a million sheets piled on top of each other would be required to equal a piece of ordinary tissue paper in thickness! This length is just about a tenth of the diameter of an atom.

The need for so refined an instrument arose from studies of magnetic materials, a subject of the greatest practical importance to the American Telephone & Telegraph Co. Magnetic materials are required not only for the many forms of telephone receivers but for many types of equipment associated particularly with long distance telephony.



At Right—Diagram Showing How Small Change in Test Specimen Is Magnified at the Photo-Electric Cell

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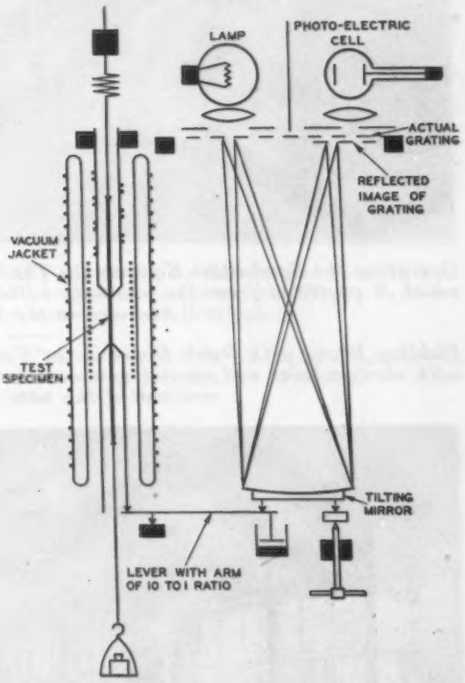
At Left—Equipment to Measure Atomic Distances Designed by P. P. Cioffi, of Bell Telephone Laboratories



Until recently it had been thought that pure iron was the most magnetic material it was possible to obtain. When G. W. Elmen of Bell Telephone Laboratories discovered permalloy, all previous theory was overthrown. This is an alloy containing 79 per cent of nickel and 21 per cent of iron, which has magnetic qualities far superior to pure iron alone. Cioffi's apparatus is used in building up a new theory to account for these remarkable properties.

Two fundamental facts were available as foundational material. When a metal is magnetized a loss occurs which evidences itself as heat. In addition a small change in the dimensions of the metal is detectable. The change is not over one part in 100,000 but is in opposite directions in iron and nickel; the former expands while the latter contracts in a magnetic field. The myriad tiny atoms composing the metal apparently turn or twist under the action of a magnetic field and, while those of iron turn so as to make the total length greater, those of nickel reverse the action. Permalloy, which neither contracts nor expands and shows very little heat, may be pictured as the well ordered scheme where little groups of iron and nickel atoms cooperate in their movements so that there is no wasted effort. The iron atoms acting in one way slip by the nickel atoms acting in another so that friction is a minimum.

The equipment is designed to measure changes of length in a piece of wire about 4 in. long. One end of the 4-in. section is fixed in position and to the other end a clamp is attached which connects to the short arm of a lever. The long arm of this lever tips a concave mirror as the wire changes its length. Light from an incandescent lamp, after passing through a suitable lens, falls on the mirror at a small angle from the perpendicular and is reflected back to a position somewhat offset from the lamp, where a photoelectric cell is mounted. Between the light source and the mirror is a grating with alternate opaque and transparent lines, each half a millimeter thick. The image of this grating falls on the mirror and is reflected back to an extension of the same grating in front of the photoelectric cell. When the images of the transparent lines are reflected back to another group of transparent lines, full light will fall on the cell. When, on the other hand, they fall on the opaque lines, no light will be transmitted. Only a very small movement of the mirror is required to cause this change from full light to no light. The photoelectric cell gives off a current proportional to the light falling on it, and this current is indicated by a sensitive galvanometer. The galvanometer indication thus serves to divide the width of one bar of the grating into a large number of smaller divisions.

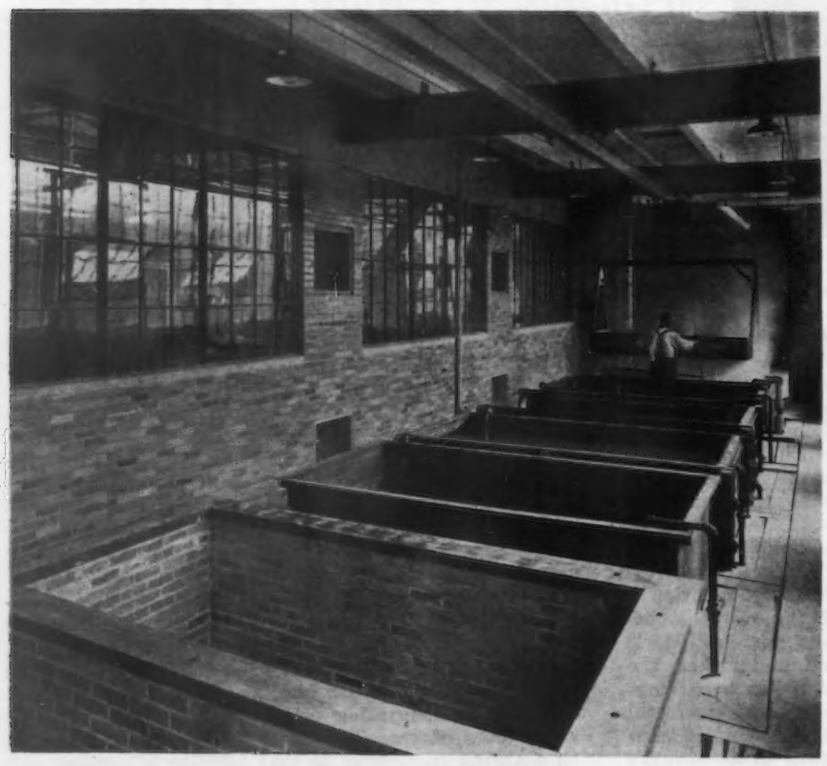
As imperceptible temperature changes cause expansion sufficient to tilt the mirror, every precaution is taken to keep the temperature of the wire constant. It is surrounded by a vacuum cylinder like a thermos bottle with an opening at each end, and in addition a special electrical compensating coil is used to maintain constant temperature. The entire equipment is mounted on a spring suspension so that building vibrations will not affect it.

Enameling Metals With the Aid of

Plant Designed for Minimum

Operating the Sand-Blast Equipment. The door at left leads to the sand bin, which is protected from the weather. Lift-truck skids for handling material will be noted in the foreground

Pickling Room, with Brick Dryer in the Foreground. Overhead is a tramrail with electric hoist and special non-corrosive tray for handling material into and out of the vats and dryer



CONVENIENT handling of materials was made a primary factor in the layout of the new plant of the Louisville Enameled Products Co., Louisville, Ky., as will be seen from the plan. The plant is one story, except for the office at one end. The use of conveyors forms the central feature of the design, while provision for expansion has been made. The building is of brick and steel, 120 x 168 ft., with ample natural lighting.

Castings or sheets for enameling go through the sand-blast room, which has a concrete sand bin close alongside arranged for direct unloading from railroad cars. The sand blasting unit, made by the Sly Mfg. Co., Cleveland, has a rotating table on which material is passed into the blasting chamber.

Pickling takes place in a separate room, served by an overhead tramrail with electric hoist. Material on trays is dipped in the successive tanks one after the other as needed and then is dried. The tramrail extends out to the black stock storage, to facilitate handling material into and out of the pickling process.

Enamel is mixed in the mill room, which contains three 500-lb. mills and two of 300 lb., with space for an additional mill. This room and the pickling room are both close to a dip tank and a line of four spray booths in which a second coat of enamel is sprayed upon the parts requiring it.

Pickle Room Has Large Over-Capacity

Monel metal baskets are used in the pickle room, which has been operating only 5 hr. a day to serve other departments operating 10 hr. Considerable expansion in output is correspondingly available. A double-strength cleaner is used and reports indicate freedom from rusting. Two "venturafin" steam units in the walls of the room eliminate vapor. A dryer is used with exposed gas burners, which are operated merely during the time that the basket of ware is in the dryer. Efficiency in drying is claimed from the fact that there are no covers or hearth plates to be heated.

Automatically Controlled Conveyors

Handling Costs and High Output

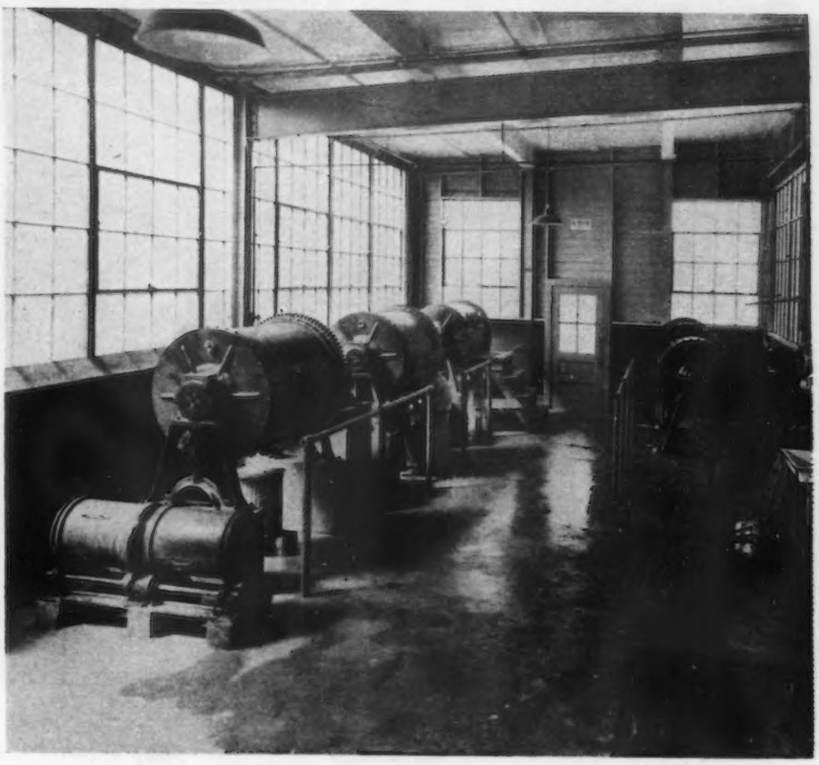
As the mills in the mill room are set with a valve clearance of about 36 in., the average-size 33-gal. can can be put underneath for unloading the mills. They are not so high, however, as to be difficult to operate. The cans are equipped with rollers for ease of handling. For loading the mill, 100-lb. cans are used. The mills all have direct electric drive. The floor of this room slopes from the center to two sides, which permits flushing without leaving water around. There are two 25-lb. laboratory mills for experimental work on colors.

There is an enamel dipping tank for flat sheets and other material, which has a revolving rack on top. The dipper hangs the dipped ware on this rack so that it will drain back into the tank. After one side of the rack is filled, it is turned around for loading the other side. By this time the ware on the first side has dripped sufficiently so that it is ready to be placed in the dryer. The dip tank itself is porcelain enameled in a blue ground coat.

Two of the spray booths are 8-ft. booths with two pedestals in each. This is for the purpose of supplying the sprayer with continuous work and permitting him to devote all his time to spraying. A helper loads and unloads the pedestals, while the sprayer, using one gun, steps back and forth from one to the other. This arrangement has yielded large production. De Vilbiss spraying units are used.

Power Conveyors Make Drying Automatic

Conveyors are used to carry the ware into the dryers immediately after spraying. All sizes and shapes of castings and sheets are run through this equipment. A hurricane dryer is used, 40 ft. long, with material passing through it on a power conveyor. Air is blown through a duct in the bottom of the dryer at 3000 cu. ft. a minute, being heated by steam to 190 deg. Fahr. With steam pressure varying from 10 to 15 lb., the temperature of the dryer is kept at about 170 deg. The speed of the conveyor is varied from 15 in. to 5 ft. a



The Five Mills Were So Placed That They Could Be Discharged Directly into 33-Gal. Cans. These cans are on casters to facilitate handling. In foreground at left is a double grinding cylinder

Dipping Tank with Rotating Rack. The man at left is placing a dipped piece upon the rack. The man at right is removing pieces after dripping. In rear is one of the spray booths

min., depending upon the character of the material going through.

A small room-type dryer along one side of one of the hurricane dryers is heated by radiation from the latter. This is used for storing clean castings and for other miscellaneous drying needs. Sliding doors permit access to any part of this room, which is 30 ft. long.

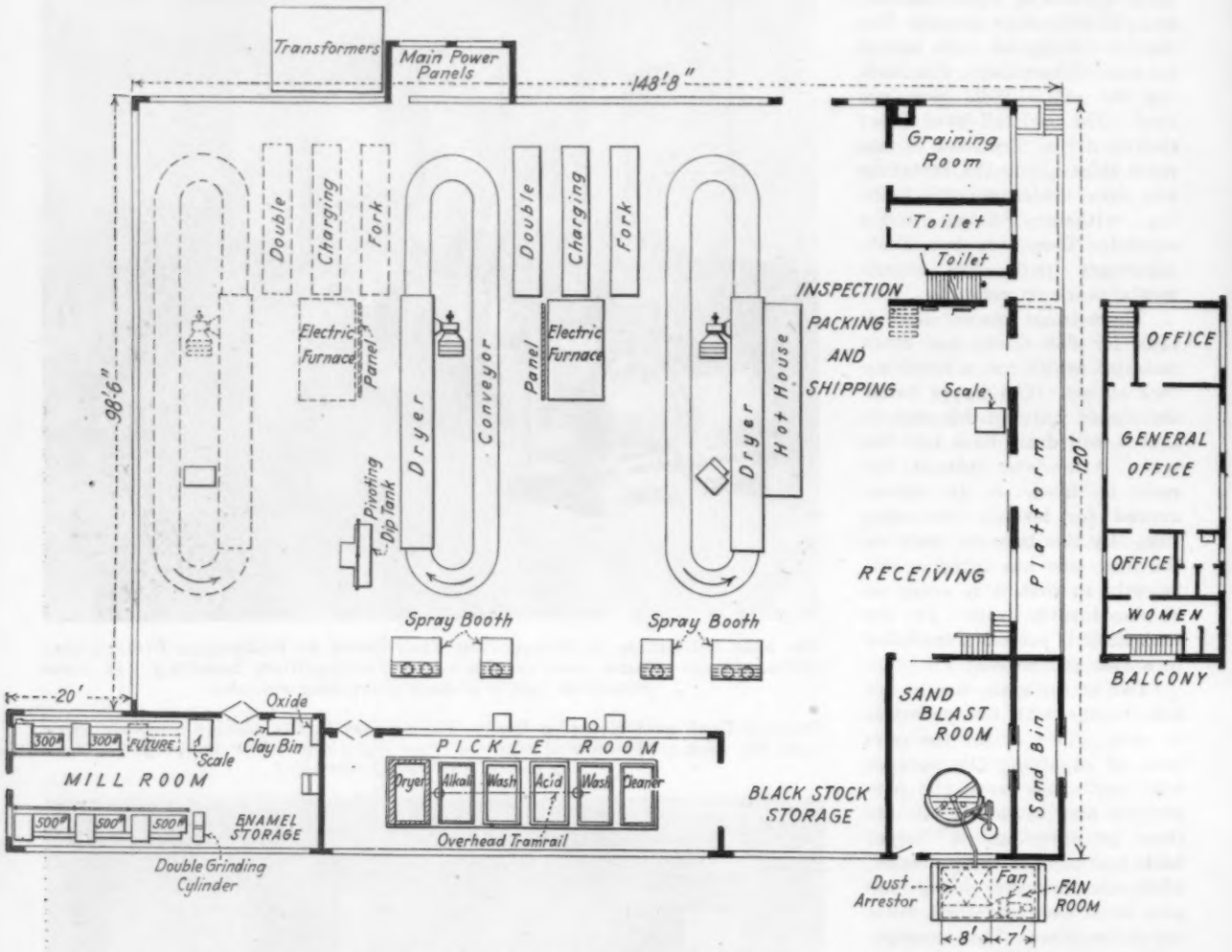
Burning on the Enamel Coatings

A box-type firing furnace heated with General Electric units, and measuring 5 x 12 ft. inside, is installed in the center of the plant. Provision is made for a second similar unit later. Cars are used to hold the material being fired. The connected load is 340 kw. on a 220-volt circuit. The heating elements are placed top and bottom, with none in the sides. In this furnace, cast iron ground coats are burned on at 1360 deg. Fahr., and cover coats at 1300 deg. At these temperatures the loading forks are double-decked, the furnace being loaded clear up to the door. The burning operation is reported to take 16 min.

Cast iron white is put on with one ground coat and one cover coat. Many of the colors are put on in one coat direct on the iron. These cast iron pieces are burned at night, as the furnace is used on the day shift for burning coatings on sheet iron and steel.

For this latter purpose, a temperature of 1580 deg. is used for the ground coat and 1520 deg. for the cover coat. The furnace is set automatically for 2½ min. for the white and 4 min. for the ground coat. Absence of warping is reported. By using long-point bars it is possible to place long narrow pieces on edge between the points. This permits the use of much larger quantities of material at a single burning. The furnace is turned on at 7 a.m. on Mondays and in 25 min. is up to the temperature for sheets, production in it being started at 7:25 a.m. At the end of the shift, the controls are set for cast iron and by the time the night force arrives the furnace is down to the required point.

In laying out the equipment for this plant, particular pains were taken to arrange the apparatus for the easiest operating conditions possible. The firing furnace was so placed as to give the burners the advantage of daylight on the forks. The conveyor dryers were arranged to bring the ware conveniently up to the forks. The whole design, layout and installation were the work of the Ferro Enamel Supply Co., Cleveland.



Layout of the Plant, with Provision for Expansion. Materials move toward the left at lower part of plan, thence toward the top, and finished goods are shipped out from the same platform which takes incoming materials. The office, shown detached, is a second floor over the receiving department

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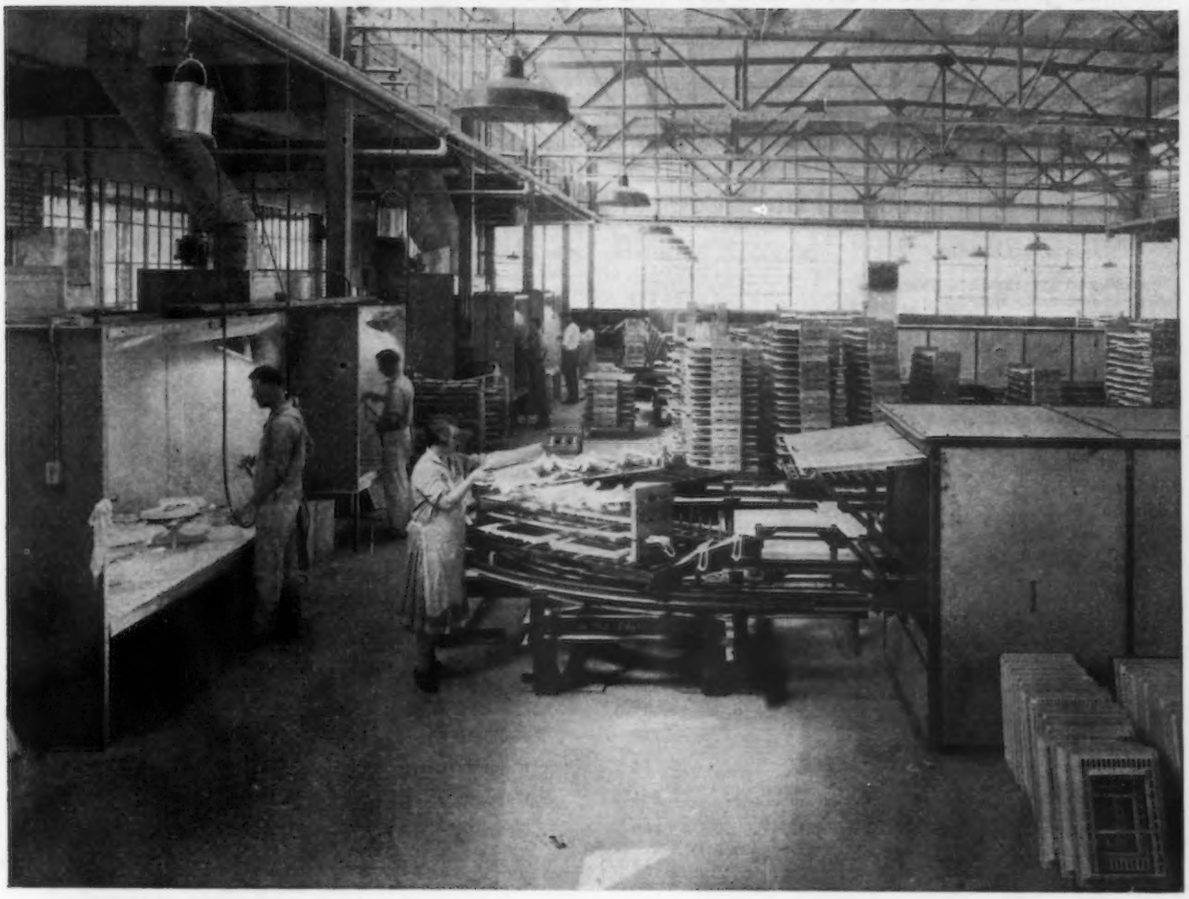
Consumption of steel in Argentina during the past two and one-half years has had a steady growth, according to a statement prepared by the Iron and Steel Division, Department of Commerce, based on a report received from Commercial Attache H. Bentley MacKenzie. The increased use of steel is attributed largely to greater activity in the building trades and the expansion of industries fabricating a variety of steel products from imported steel.

Although there was a decline in the number of persons employed in Illinois factories in December, wages remained at peak levels, according to a report by the bureau of labor statistics of the Illinois Department of Labor. The number of factory workers in December touched the lowest point of any month in five years.



SPRAY Booths and Drying Oven (Above), Showing Convenient Arrangement for Placing the Sprayed Material Upon the Conveyor Serving the Oven. The speed of conveyor is adjusted to suit the time the material must remain in the oven

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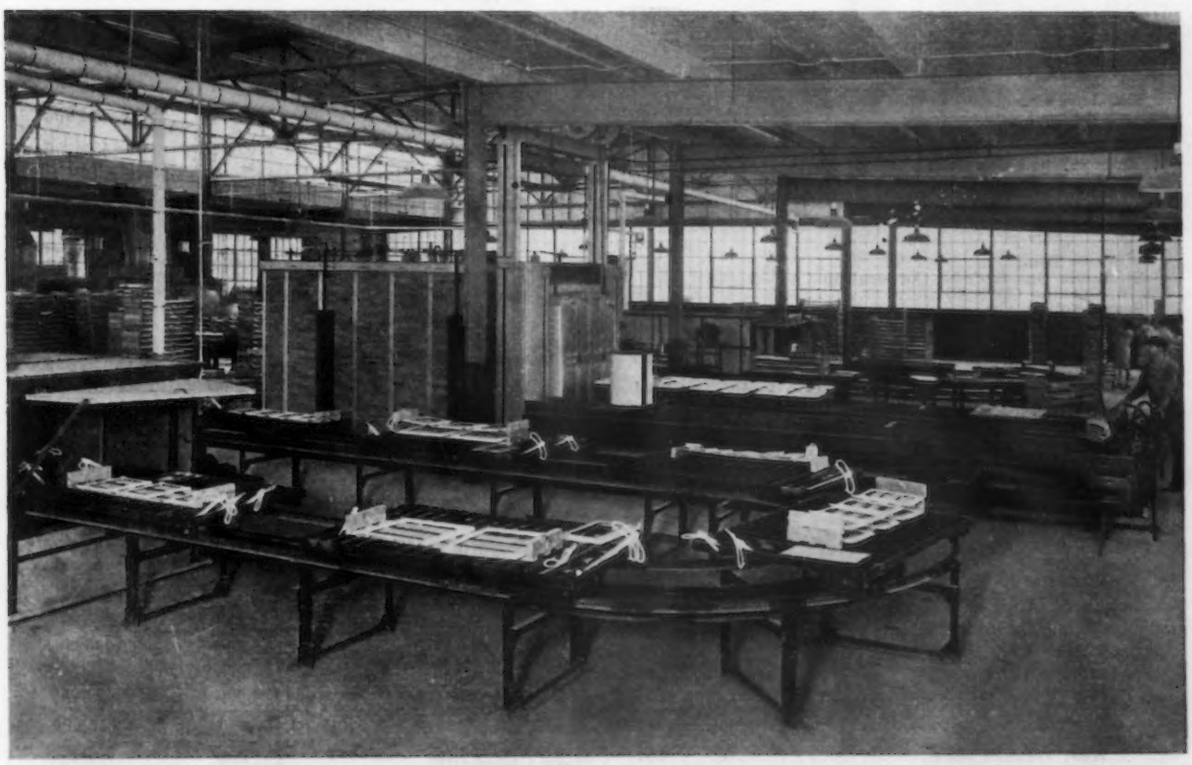
Exit from Drying Oven (Below). In the background is the electrically heated firing oven for burning on the coating. It is served by a car on which the material is carried into the oven



By-Product Coke Capacity Gains Little

FIGURES on by-product coke oven capacity, revised by THE IRON AGE *and given below, show that construction of new capacity paused after the unusual activity of* 1926. *While ovens now standing and in course of construction have capacity for carbonizing* 83,826,638 *net tons of coal annually, with a resultant estimated yield of coke of* 58,555,726 *tons (compared with* 81,663,703 *tons and* 57,631,422 *tons respectively at the end of* 1926), *there actually has been more dismantling than construction, since the total number of ovens built and building as of Jan.* 1, 1928, *is* 12,756 *compared with* 12,833 *one year before. At the end of* 1927 *there were* 238 *ovens under construction.*

Iron and Steel Company By-Product Coke Plants

Name and Location	No. of Ovens	Kind of Oven	Annual Capacity Net Tons Coal	Annual Capacity Net Tons Coke
Ashland By-Product Coke Co.				
Ashland, Ky.	108	Semet-Solvay	803,000	602,000
Bethlehem Steel Co.				
Bethlehem, Pa.	424	Koppers	2,502,080	1,787,520
Steelton, Pa.	180	120 Semet-Solvay	423,360	302,400
		60 Koppers	404,320	288,960
Sparrows Point, Md.	360	Koppers	2,446,080	1,747,200
Lackawanna, N. Y.	231	60 Semet-Solvay	442,400	315,840
		171 Koppers-Becker	1,439,200	1,028,160
Johnstown, Pa.				
Rosedale	208	120 Cambria-Improved	658,560	470,400
		88 Semet-Solvay	696,640	497,280
Franklin	231	50 Koppers	259,840	185,472
		104 Cambria-Improved	406,560	291,648
		77 Koppers-Becker	537,600	383,040
Total Bethlehem Steel Co.	1,634	Total	10,216,640	7,297,920
Central Alloy Steel Corporation				
Massillon, Ohio	49	Koppers-Becker	438,000	290,000
Canton, Ohio	47	Koppers	280,000	196,000
Total	96	Total	718,000	486,000
Central Iron & Coal Co.				
Holt, Ala.	60	Semet-Solvay	290,000	220,000
Colorado Fuel & Iron Co.				
Minnequa, Colo.	120	Koppers	860,000	600,000
Columbia Steel Corporation				
Provo, Utah	56	Koppers-Becker	613,000	400,000
Corrigan-McKinney Steel Co.				
Cleveland	204	Koppers	1,300,000	1,000,000
Donner-Hanna Coke Corporation				
Buffalo	150	Koppers	1,000,000	700,000
Ford Motor Co.				
Dearborn, Mich.	240	120 Semet-Solvay	840,000	630,000
		120 Wilputte	985,000	739,000
		Total	1,825,000	1,369,000
Gulf States Steel Co.				
Alabama City, Ala.	37	Koppers	263,370	186,138
Hamilton Coke & Iron Co.				
Hamilton, Ohio	†45	Koppers-Becker	416,000	291,200
Inland Steel Co.				
Indiana Harbor, Ind.	203	130 Koppers	890,000	623,000
		73 Koppers-Becker	620,900	434,650
		Total	1,510,900	1,057,650
Ironton By-Product Coke Co.				
Ironton, Ohio	60	Semet-Solvay	730,000	547,000
Jones & Laughlin Steel Corporation				
Pittsburgh	360	60 Wilputte	438,000	306,600
		300 Koppers	2,000,000	1,400,000
Woodlawn, Pa.	122	Koppers-Becker	1,100,000	770,000
Total	482	Total	3,538,000	2,476,600
Otis Steel Co.				
Cleveland	100	Semet-Solvay	475,000	356,250
Perry Iron Co.				
Erie, Pa.	37	Wilputte	300,000	210,000
Pittsburgh Crucible Steel Co.				
Midland, Pa.	100	Koppers	667,000	446,900
Portsmouth By-Product Coke Co.				
Portsmouth, Ohio	108	Semet-Solvay	770,000	559,000
Rainey-Wood Coke Co.				
Swedeland, Pa.	110	Koppers	800,000	560,000
Republic Iron & Steel Co.				
Youngstown, Ohio	204	100 Koppers	667,000	466,900
		104 Koppers-Becker	957,500	670,000
Thomas, Ala.	57	Koppers-Becker	720,500	504,350
Total	261	Total	2,345,000	1,641,250
St. Louis Gas & Coke Corporation				
Granite City, Ill.	80	Roberts	750,000	525,000
Semet-Solvay Co.				
*Benwood, W. Va.	120	Semet-Solvay	270,000	189,000
Sloss-Sheffield Steel & Iron Co.				
Birmingham, Ala.	120	Semet-Solvay	1,000,000	750,000
Toledo Furnace Co.				
Toledo	94	Koppers	560,000	392,000
Trumbull-Cliffs Furnace Co.				
Warren, Ohio	64	Koppers-Becker	636,000	414,000
Weirton Steel Co.				
Weirton, W. Va.	83	Koppers-Becker	830,000	581,000
Wheeling Steel Corporation				
East Steubenville, W. Va.	145	94 Koppers	610,000	427,000
		51 Koppers-Becker	346,750	242,725
		Total	956,750	669,725
Wisconsin Steel Co.				
South Chicago	88	Wilputte	578,000	404,600
Woodward Iron Co.				
Woodward, Ala.	230	170 Koppers	1,051,200	735,840
		60 Wilputte	371,000	259,700
		Total	1,422,200	995,540
Youngstown Sheet & Tube Co.				
Youngstown, Ohio	390	Koppers	2,319,000	1,083,000
Indiana Harbor, Ind.	190	†70 Koppers-Becker	740,000	518,000
		120 Semet-Solvay	893,000	620,000
Mayville, Wis.	108	United-Otto	499,000	394,000
Total	688	Total	4,451,000	2,615,000
Zenith Furnace Co.				
West Duluth, Minn.	106	†41 Koppers-Becker	350,000	245,000
		65 United-Otto	225,000	158,000
		Total	575,000	403,000

*Idle.

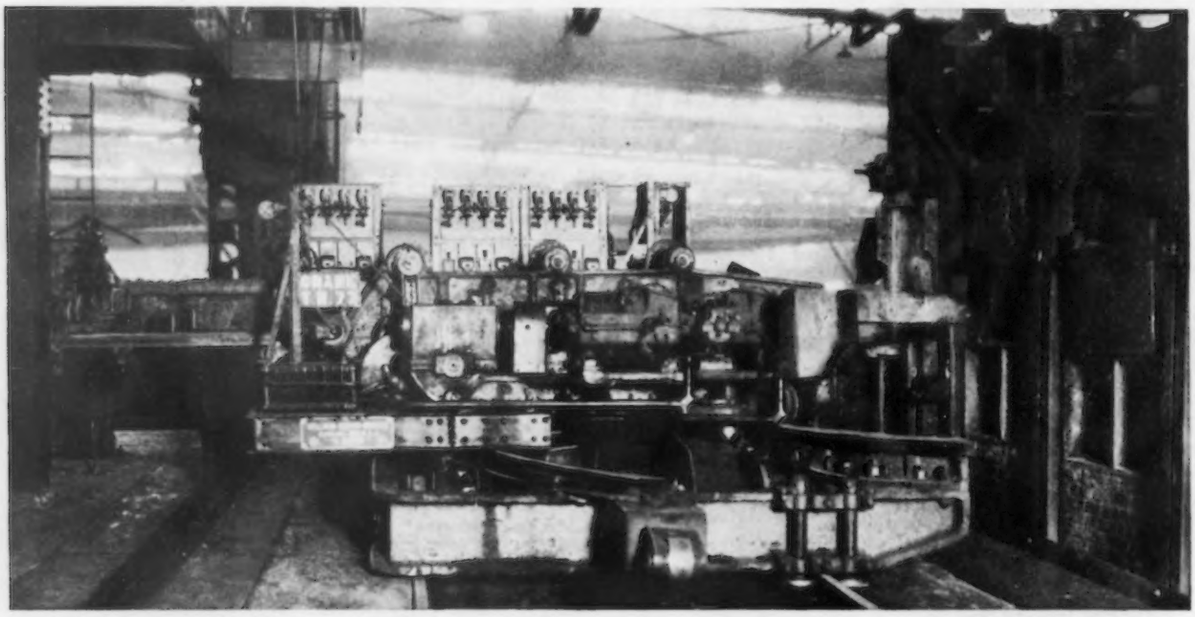
Name and Location	No. of Ovens	Kind of Oven		Annual Capacity Net Tons Coal	Coke
United States Steel Corporation					
American Steel & Wire Co.					
Cleveland	180	Koppers		1,360,000	950,000
Carnegie Steel Co.					
Clairton, Pa.	1,482	768 Koppers 714 Koppers-Becker		10,500,000	6,531,000
Illinois Steel Co.					
Gary, Ind.	838	700 Koppers 138 Koppers-Becker		5,942,200	4,545,800
Joliet, Ill.	280	Koppers		1,727,000	1,313,600
Total	1,118		Total	7,669,200	5,859,400
Minnesota Steel Co.					
Duluth, Minn.	90	Koppers		510,000	375,000
National Tube Co.					
Lorain, Ohio	208	Koppers		1,581,000	1,120,000
Tennessee Coal, Iron & Railroad Co.					
Fairfield, Ala.	497	434 Koppers 63 Koppers-Becker		3,462,400	2,436,250
Total United States Steel Corporation.	3,575		Total	24,082,600	17,271,650
Total all companies	9,604		Total	66,305,460	46,028,423

Commercial or Gas Plants

Alabama By-Products Corporation					
Tarrant, Ala.	149	100 Koppers 49 Koppers-Becker		669,000 500,000	468,300 350,000
			Total	1,169,000	818,300
Battle Creek Gas Co.					
Battle Creek, Mich.	18	Koppers-Becker		88,700	62,100
By-Products Coke Corporation					
South Chicago	230	120 Semet-Solvay 110 Koppers-Becker		700,000 1,000,000	525,000 700,000
			Total	1,700,000	1,225,000
Camden Coke Co.					
Camden, N. J.	37	Koppers		205,800	144,100
Central Indiana Gas Co.					
Muncie, Ind.	22	Klonne		40,000	28,000
Chicago By-Products Coke Co.					
Chicago	105	5 Koppers-Becker 100 Koppers		800,000	600,000
Citizens Gas Co.					
Indianapolis	121	80 Wilputte 41 Semet-Solvay		394,200 224,475	295,650 168,356
			Total	618,675	464,006
*Coal Products Mfg. Co.					
Joliet, Ill.	53	35 Koppers 18 Wilputte		225,000 115,000	157,500 80,500
			Total	340,000	238,000
Connecticut Coke Co.					
New Haven	†61	Koppers-Becker		416,000	291,200
Consolidated Gas Co.					
Hunts Point, N. Y.	74	Koppers-Becker		638,750	447,100
Consumers Power Co.					
Jackson, Mich.	63	Koppers-Becker		257,500	180,250
Diamond Alkali Co.					
Alkali, Ohio	46	Koppers-Becker		431,430	303,021
Domestic Coke Corporation					
Fairmont, W. Va.	60	Koppers		400,000	280,000
Empire Coke Co.					
Geneva, N. Y.	46	Semet-Solvay		146,000	102,200
Hudson Valley Coke & Products Corporation					
Troy, N. Y.	55	Foundation		540,000	380,000
Indiana Consumers Gas & By-Products Co.					
Terre Haute, Ind.	60	Koppers		400,000	280,000
Laclede Gas Light Co.					
St. Louis	64	56 Koppers 8 Piette		320,000 40,000	224,000 28,000
			Total	360,000	252,000
Linton Gas Co.					
Linton, Ind.	3	Gas Machines		15,000	10,500
Lynn Gas & Electric Co.					
Lynn, Mass.	11	Koppers-Becker		54,000	37,800
Michigan Alkali Co.					
Wyandotte, Mich.	39	Koppers-Becker		324,000	226,800
Milwaukee Coke & Gas Co.					
Milwaukee, Wis.	180	80 Semet-Solvay 100 Koppers		343,000 679,000	240,100 475,300
			Total	1,022,000	715,400
Minnesota By-Products Coke Co.					
St. Paul, Minn.	65	Koppers		400,000	280,000
New England Fuel & Transportation Co.					
Everett, Mass.	451	400 United-Otto 51 Wilputte		650,000 372,000	455,000 260,610
			Total	1,022,000	715,610
North Shore Coke & Chemical Co.					
Waukegan, Ill.	43	†31 Koppers-Becker 13 Semet-Solvay		165,000 55,000	115,500 38,500
			Total	220,000	154,000
Northern Indiana Gas & Electric Co.					
Fort Wayne, Ind.	19	Koppers-Becker		94,300	65,000
Philadelphia Suburban Gas & Electric Co.					
Chester, Pa.	25	Roberts		165,000	120,500
Providence Gas Co.					
Sassafras Point, R. I.	40	Koppers		240,000	168,000
Rochester Gas & Electric Corporation					
Rochester, N. Y.	60	Koppers-Becker		274,000	191,800
Seaboard By-Products Coke Co.					
Kearney, N. J.	165	Koppers		1,200,000	840,000
Seattle Lighting Co.					
Seattle, Wash.	20	Klonne		70,000	42,350
Semet-Solvay Co.					
Detroit	216	Semet-Solvay		1,423,000	1,081,000
Buffalo	120	Semet-Solvay		1,053,000	795,000
*Dunbar, Pa.	110	Semet-Solvay		240,000	173,000
Ensley, Ala.	240	Semet-Solvay		730,000	547,000
Tennessee Products Corporation					
Alton Park, Tenn.	24	Semet-Solvay		175,000	125,000
Utica Gas & Electric Co.					
Utica, N. Y.	42	Koppers-Becker		200,000	110,000
West Boston Gas Co.					
Framingham, Mass.	15	Koppers-Becker		47,523	33,266
Total all companies	3,152			17,521,178	12,527,303
Grand total	12,756			83,826,638	58,555,726

*Idle. †Building.

Pivoting Type of Ingot-Turning Machine for Furnaces Heating Steel to Be Pierced for Making Seamless Tubes



INGOT-TURNING MACHINE

Labor Saving Equipment for Furnaces Serving Pilger Tube Mills

IN manufacturing seamless tubes on Pilger mills, tapered round ingots of a diameter approximately one-half larger than the finished product are generally used. These are heated, preliminary to the piercing process, in a continuous heating furnace having a long inclined hearth. The taper on these ingots prevents their rolling down the inclined hearth in a line parallel to the walls, their natural path being rather in the arc of a large circle.

To meet this situation it has been customary to provide the side walls of the furnace with a series of doors or poke holes, spaced 3 or 4 ft. centers. Through these holes bars are inserted and the ingots thus straightened on the hearth and rolled down toward the discharge end. This is all done by hand labor. The extreme heat as well as the size of ingots required for large tubes makes it difficult to maintain a suitable force of men, and the operation is slow and in general unsatisfactory.

To overcome this difficulty, the Wellman-Seaver-Morgan Co., Cleveland, has recently developed and put into successful operation two fully mechanically operated "barring" or ingot turning machines, for eliminating the strenuous hand labor described.

These machines are typically American, being of "steel mill" design, i.e., they are of cast steel construction and extremely rugged. Traveling on an inclined track parallel with the furnaces, and having the same slope as the furnace hearth, they perform all the functions previously done by hand, with greater speed and ease, and in addition eliminate several men from the force required to handle each furnace.

Each machine consists of two carriages. The lower one is a massive one-piece steel casting mounted on four wheels, engaging the main inclined track. These wheels are driven in pairs by two motors. On the upper surface of the lower carriage is carried a section of circular track, the radius point being located at the center of the furnace wall. The upper carriage travels on this curved track and carries a long wedge-shaped bar which can be moved in and out of the furnace. Swinging about the radius point, the bar can be rocked vertically and also turned about a horizontal axis. Each motion has its independent motor, all under direct control of the operator, who is located at the rear and to one side of the center of the upper carriage.

Location of the pivot point of the bar, when swinging in a horizontal plane, is such that extreme angularity may be obtained, regardless of its position in relation to the furnace. To facilitate changing bars, a quickly detachable connection is provided between the bar and its supporting spindle.

Three of the larger ingots may be straightened on the hearth or rolled down its inclined surface at one time by each machine. In case ingots become partially welded together, they may be "sliced" or separated by the bar, due to its shape.

Most of the drives are of the worm type. The worm reductions, as well as all spur gear reductions, operate in oil baths contained in cast steel housings. Due to governing clearances, these machines are compact, yet all parts are readily accessible for inspection or repair. The salient features of construction are protected by pending United States patents.

Welsh Tin Plate Industry to Adopt American Methods

As a result of a recent decision made by Welsh steel and tin plate manufacturers to meet foreign competition in the tin plate trade, engineering work on a large scale is expected in South Wales centers. The introduction of steel strip mills in America has revolutionized the tin plate industry, reducing costs about 2s. (48c.) per standard box. Steel strip 1/16 in. thick, at a cost of little over that for bars, cuts out most of the work in preparing the steel for conversion into tin plate, and Welsh makers fully appreciate the fact that they must adopt the new methods or be driven out of world markets.

It is understood that an outlay of $5,000,000 or more in new plant at the steel works will be involved, and as the majority of the independent steel and tin plate firms cannot face such an outlay, an influential committee has been appointed to see what can be done to meet the need by combination.

The Llanelly Steel Co. is laying down six new sheet mills and a new bar mill alongside its existing works, on the latest American principles. These mills are designed for a continuous process, to yield high output and cheapen production costs.

Wire netting and woven wire, including chain link fencing, are included in a list of goods affected by a recent first order-in-council of the United Kingdom requiring a mark of origin under the Merchandise Marks act, 1926, according to the London Board of Trade Journal, says a statement issued by the Department of Commerce, Washington.

SHEET PACK OPENER

Ten-Sheet Packs Up to 148 In. in Length and 48 In. or More in Width Opened Rapidly

VISITORS to the sheet mills at the Campbell works of the Youngstown Sheet & Tube Co. have been interested in a mechanical sheet pack opener which is in operation there. Results so far attained indicate that another step has been made in the reduction of manual labor in sheet mill operation. This opener was developed and patented by the American Sheet Opener Corporation, Apollo, Pa., and is being built and marketed by the United Engineering & Foundry Co., Pittsburgh. Another machine of this design has been in use for two years at the plant of the Apollo Steel Co., Apollo, Pa.

Two major units of the machine are a set of horizontal rods arranged one above the other and a traveling motor-driven gripper head into which the sheets are introduced between the rods. The rods serve as the separating agency with the backward movement of the gripper head. A pair of pinch rolls carry the packs from a storage platform to a man who inserts the slightly opened sheets through the rods to the gripper head.

The machine calls for a crew of three men, one to operate it, one on the storage platform and the third to pile the opened sheets as they come through the separating rods. A crew of five men, consisting of the operator, two men on the storage platform and two for piling the separated sheets, has been used. The two extra men meant a smoother operation as the sheet packs are slightly opened by the platform men before they are passed to the operator and the movement to the operator was more constant than it would have been with one man serving. With two men handling the opened sheets, more even piling was possible than if one man was doing the work.

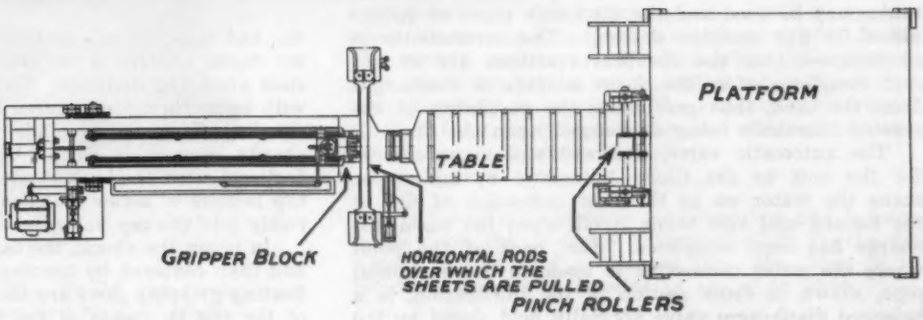
In ordinary sheet mill practice one shear serves two mills and at each shear there is one pack opener. In a 12-mill plant there would be six openers, or 18 for a three-turn day. This mechanical opener will handle the output of 12 mills or six shears and on a basis of three men to the crew or nine for a three-turn day it is pointed out that the labor item is exactly halved. The use of the machine means that instead of opening and piling the sheared packs at the shears, they will be taken after shearing and stacked on the platform of the opener. The mechanical method of opening is rapid.

From a pile of sheared sheet packs, the platform man takes a pack and slightly opens it on one end. He then feeds it to the pinch rolls which deliver it to the

BACKWARD Movement of the Gripper Block Pulls the Sheets Over the Rods and Separates Them

FROM the Platform, the Slightly Opened Pack Goes Through the Pinch Rollers to the Machine Operator, Who Enters the Ends of the Sheets Through the Rods. A sweeper arm then pushes the sheets into the openings in the gripper blocks. The ends of the sheets are clamped before the backward traverse of the gripping head

THE Arrangement of the Various Elements of the Mechanical Opener May Be Noted from Plan View at the Right

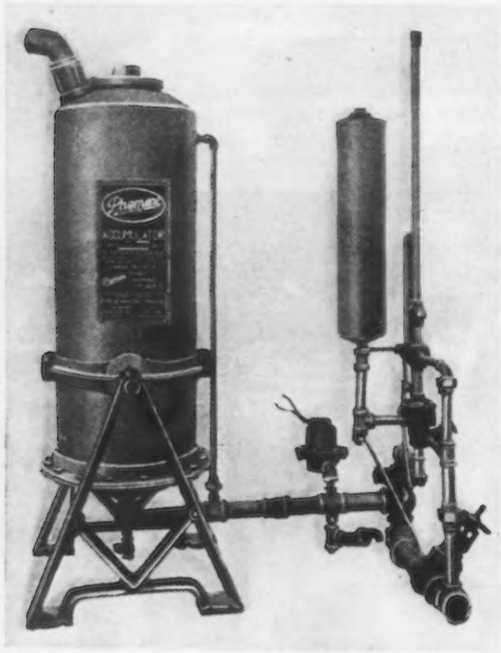


machine operator, who inserts a spacing fork between the open sheets and enters them through the rods. An air-operated sweeper arm pushes the sheets into the openings in the gripper blocks. The ends of the sheets then are clamped in the block, a backward movement of which pulls the sheets over the rods and separates them.

The gripper head and the pinch rolls are motor-operated, while the grippers and the cylinders operating the sweeper arm are actuated by compressed air.

Foam Protection for Flammable Liquid Hazards Is Demonstrated

A demonstration of the Phomene accumulator system for protection of flammable liquid hazards was given jointly by the Globe Automatic Sprinkler Co., Philadelphia, and the Pyrene Mfg. Co., Newark, N. J., at the latter's plant, 109 Meeker Avenue, Newark, on Jan. 19. A feature of the exhibition was the extinguishing of oil fire in a 30-ft. tank section by means



The Large Tank on the Left Is Capable of Producing 2400 Gal. of Foam

of the new foam extinguisher system. Protection of flammable liquid hazard from external ignition and the automatic quenching of fires in a spray booth and a dip tank were also demonstrated.

The Phomene accumulator system, shown in the accompanying illustration, is 5 ft. 3 in. high and has a base area, including the automatic valve, of 9 sq. ft. The large tank is filled with a charge of 280 lb. of Phomene foam-making powder, capable of producing 2400 gal. of foam. When water is admitted through the pipe connecting the tank with the automatic valve, foam is generated in the accumulator and discharged through the outlet at the top of the tank. As was shown in the demonstration this outlet pipe may be extended to any desired length and equipped with any sort of a spraying or discharging system which may be most suitable to the installation.

In case of very dangerous hazards two or more tanks may be used and the discharge pipes or sprays placed in any position desired. The accumulator is so designed that the chemical reactions are 90 per cent complete before the foam mixture is discharged from the tank, thus precluding the possibility of unreacted chemicals being discharged upon the fire.

The automatic valve, designed and manufactured for the unit by the Globe Automatic Sprinkler Co., turns the water on at the first indication of fire at the hazard and also turns it off when the foam discharge has been completed. Just back of the point where the water connection is made in the horizontal pipe, shown in cross section in the illustration, is a balanced diaphragm valve normally held closed by the water pressure in the smaller pipe attached perpendicularly to the main water connection. This smaller pipe may be continued as a ¾-in. line to the hazard, terminating in one or more standard sprinkler heads.

When a fire starts, the rupturing of these heads will allow the pressure in the small pipe to fall. The valve will then open, admitting water to the accumulator and at the same time sounding an alarm bell. The sprinkler line will not discharge water on the hazard, but will drain through a small valve. An electrical thermostatic device may be provided for faster use and where the hazard is exposed to freezing temperatures.

The accumulator will operate properly, it is claimed, on an applied water pressure of 25 lb. per sq. in. or higher, the most desirable pressure being 50 to 60 lb. per sq. in. The rate of discharge is about 1000 gal. per min., but may be varied by regulation of the water pressure.

Tap Holding Chuck

The Eastern Tube & Tool Co., 594 Johnson Avenue, Brooklyn, N. Y., is adding to its line the tap-holding chuck here shown, one feature of which is the arrangement whereby the operator can see the two floating jaws gripping the square on the shank.

The square of the tap is held by the two floating jaws which are tightened with a key and the grip is said to be positive. The jaws operate by means of a right- and left-hand thread and are free to float transversely, as their only function is to grip the square and prevent the tap from rotating. The tap is centered by three jaws inclosed in the knurled collar. The two gripping jaws for the square of the tap are of alloy tool steel, heat-treated and ground to an accurate fit in the body. The lower centering jaws are also of alloy steel, heat-treated and ground.

Three sizes of the tap chuck are manufactured. The smallest, the No. 1, is for round shanks up to ¼ in. and taps ⅜ in.; the No. 2 size is for round shanks ⅜ in., and taps, ½ in.; and the No. 3 size has capacity for round shanks ½ in. and taps ⅝ in. Two larger sizes are being designed. The chucks can be furnished with backs threaded, tapered backs or with Morse taper shanks. Provision is made for pinning the threaded shanks securely in place. The chucks are also manufactured with the back extended 1 in. to permit use in tap holders of screw machines. The tap chuck fits directly into the tap holder and is held by a set screw.

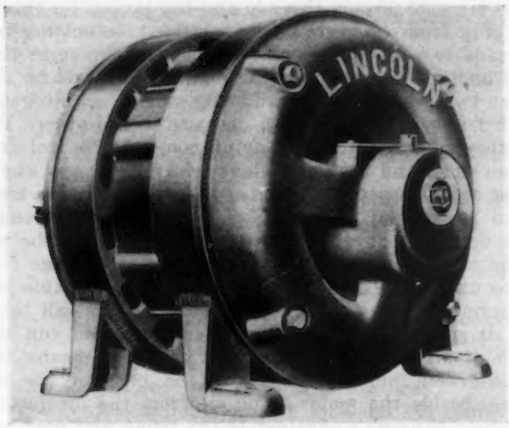
Drills, Reamers and Other Tools Can Be Used in the Chuck by Grinding a Flat on the Shank

In using the chuck, the tap or other tool is inserted and then centered by turning the knurled collar. The floating gripping jaws are then tightened on the square of the tap by means of the key.

Motor Designed to Start Directly Across the Line

The Lincoln Electric Co., Cleveland, is marketing a new motor, named the Switch Start, which is available in sizes from ½ to 30 hp. and for two or three phase, 60 cycles.

This motor is designed so that it can be started directly across the line without the use of a starting compensator, starting resistance or other voltage-reducing device, with starting current below the requirements of the National Electric Light Association. It is stated that operating characteristics, such as power



The Motor Is Available in Sizes from ½ to 30 Hp.

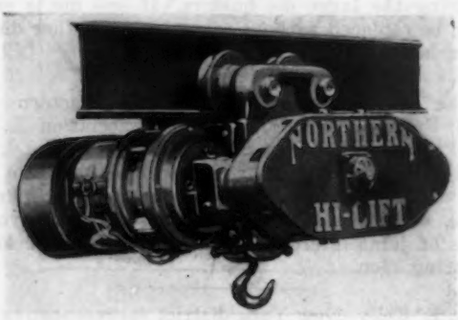
factor, efficiency, maximum torque, temperature rise, etc., have not been sacrificed in order to secure low starting currents. Tests are said to show that starting torques from full load to better than 250 per cent of full load, depending on the horsepower and speed, are possible without exceeding the N. E. L. A. requirements as to starting currents.

Comparison of the speed torque curves of the new motors with the ordinary self-start motors is said to show that the former has equal or slightly higher torque at zero speed. The curve of the Switch Start motor then shows a gradually increasing torque up to the maximum torque point, which is desirable for starting many types of machinery. High pull-out torque, which is of importance in that the motor will not stall on sudden high overloads, is also claimed. Comparatively low temperature rise under continuous full load is attributed not only to the electrical design but also to the welded steel construction which permits greater circulation of air. The motor is normally equipped with sleeve bearings, but ball bearings can be furnished. Larger shafts, larger bearings and waterproofing insulation are also claimed for these motors.

Compact Electric Hoist With High Hook Lift

Compactness and accessibility, as well as rigidity and high hook left, are features of a new series of Hi-Lift hoists being marketed by the Northern Engineering Works, Detroit. One and two motor designs are available.

The hoists are mounted on a plain I-beam trolley



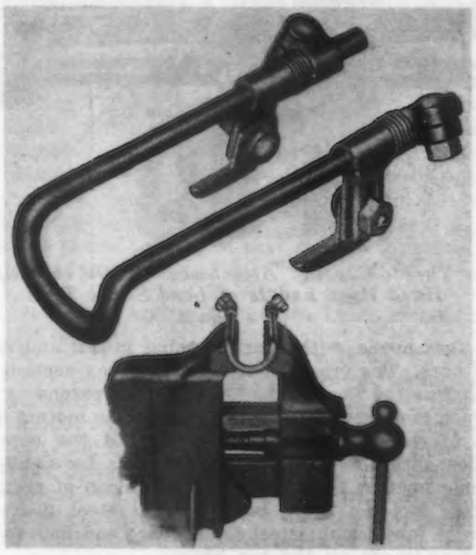
The Load Hook May Be 14 In. from Under Side of Beam to Center of Hook

and have current collectors. They are provided with two brakes, a motor check brake attached to the end of the hoist motor armature shaft, and a mechanical load brake in the hoisting gear train. This brake, of positive friction disk ratchet type, is similar to that on other of the company's hoists. A feature is the one-piece unit casting now used for the gear train and motor support, the sides of which being cast integrally, assure permanent alinement. This casting is arranged so that the shroud fits over the ends of the drum, which eliminates the possibility of the hoisting rope creeping over the ends of the drum. The hoist is suspended by a substantial cast steel hanger piece. The motor and gear train are connected by a flexible coupling, which compensates for any slight misalinement.

The load hook is capable of being pulled up within 14 in. from the under side of the beam to the center of the hook. Two stops are provided, one to prevent the load hook from going up too high, and the other to prevent it from completely unwinding the rope and starting it up on the wrong side of the drum. Gear covers are split horizontally and can be removed conveniently for inspection or removal of the gearing, without disturbing the other parts. Another feature is the method of attaching the rope to the drum whereby the cable with the end thimbles can be installed conveniently. The lower limit stop includes a spring-actuated tripper which springs out after the last layer of rope is off the drum. This makes contact with the levers for the upper limit stop, controlling the downward movement of the load block.

Work Support for Use in Vises

A work support for use on any standard vise and intended to increase the holding power, particularly on work of eccentric shape or stock with very little grip-



The Holding Power, Especially on Stock of Irregular Shape, Is Increased

ping surface, is being marketed by A. F. K. Fountain Works, Milwaukee.

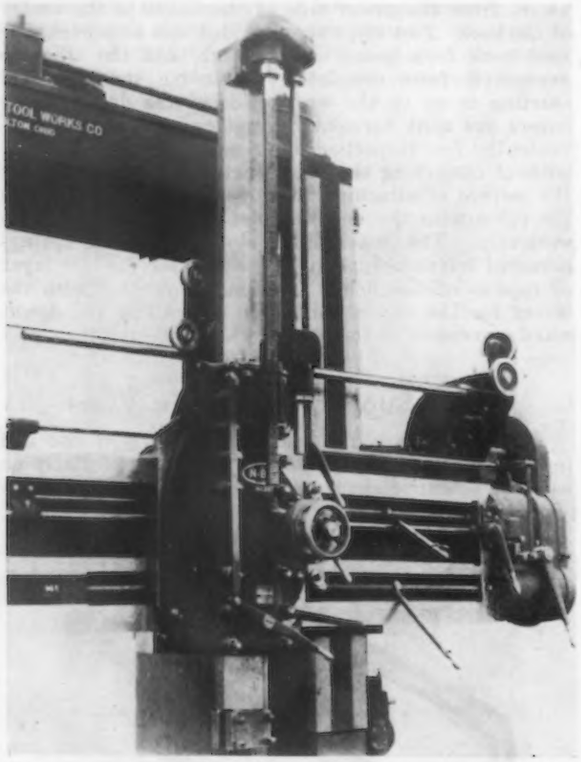
The arrangement of the device, which may be conveniently attached and removed from the vise, may be noted from the accompanying illustrations. The supporting yoke is of nickel steel, case hardened to prevent distortion. The corrugated adjustable clamps are malleable iron castings and are held by 5/16-in. bolts. The torsion springs are of piano wire. It is claimed that thin brass tubing can be held firmly without slipping, crushing or marring. The support shown is for stock of from ¼ to 2 in. in diameter, although supports for larger stock can be furnished.

The thirteenth international convention and Inform-A-Show of the National Association of Purchasing Agents will be held at Kansas City, Mo., May 28-31. Headquarters of the association are at 11 Park Place, New York.

12-Ft. Boring and Turning Mill with Thread-Chasing Attachment

Equipment of the right-hand head with a thread-chasing attachment is a major new feature of the 12-ft. boring and turning mill illustrated which has been brought out by the Niles Tool Works Co., division of the Niles-Bement-Pond Co., Hamilton, Ohio. In general design the machine follows the new 18-in. and 20-in. boring and turning mills described recently in THE IRON AGE. The thread-chasing attachment is of the lead-screw type and gives leads up to 2 in.

Features in common with the larger mills include double table tracks, with pressure lubrication; sliding



The Thread-Chasing Attachment Is On the Right-Hand Head and Is of Lead Screw Type

gear feed boxes, with gears running in oil; and forged steel bars. The crossrail is of square box section with bearing on the face of the housings and extending back between the housings. There are separate motors at the back of the rail for rapid traverse of the bars and saddles; direct-reading micrometer dials for saddle and bar movements; limit switch for elevation of crossrail; entirely inclosed drive box with all steel gears and pressure lubrication; steel table gear; and inclosed rail elevating gears on the top brace.

The machine is driven by a 35-hp., direct current, 4 to 1 variable speed motor, giving table speeds ranging from 0.56 to 10.8 r.p.m. A 7½-hp. motor is employed for the crossrail and two 5-hp. motors, one for each head, for rapid traverse of saddles and bars. A ½-hp. motor drives the oil pump.

Feed and traverse movements of bars and saddles are obtained through large friction clutches housed at the end of the rail, but for the chasing mechanism positive motion is provided through an additional train of shafts and gears. Threads are engaged by half nuts closed by a lever at the base of the saddle. A handwheel on the saddle releases the bar rack pinion when the chasing attachment is in use. Three leads are furnished, but these may be varied by means of additional gear ratios.

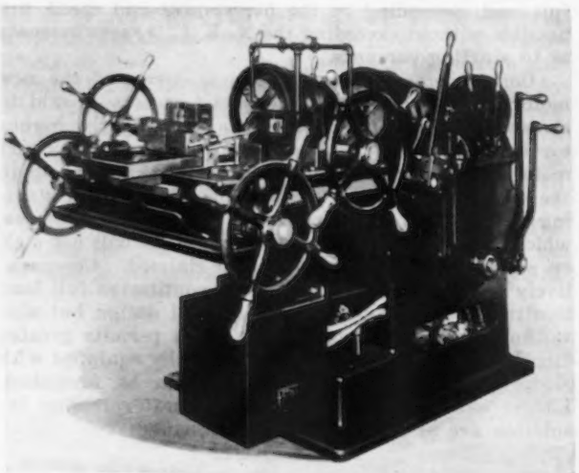
Bituminous coal mined in the second week in January is reported by the United States Bureau of Mines at 10,871,000 net tons. This is a gain of more than 10 per cent over the preceding week, but lacks 20 per cent of the large output of the corresponding week a year ago.

Double-Head Bolt Threader With Eight Speeds for Each Head

The Williams Tool Corporation, Erie, Pa., is bringing out the double geared-head bolt threading machine illustrated, which is provided with eight spindle speeds for each head and is arranged for complete control from either side of the machine.

Features of the company's Rapiduction single-head bolt threader, previously described in THE IRON AGE, are incorporated but the double-head unit is intended for a wider range of threading production. Two sizes of the machine are available, the smaller being for cutting ⅜-in. to 1½-in. threads and the larger for threads ranging from ½ in. to 2 in. inclusive. In cutting long threads two set-ups may be handled at the same time, and another source of saving claimed is in set-up time when two different sizes are being run through together with frequent change from one size to the other. Production is facilitated by having complete control from either side, and the convenient selection of any one of eight spindle speeds is pointed out as permitting maximum production on each size of bolt being threaded. The driving motor is mounted in the base of the machine and is entirely inclosed to prevent damage from chips and dirt. It is provided with an adjustable base to permit keeping the driving chain tight at all times. All driving gears are of hardened steel, and run in a bath of oil. Die heads are lubricated by means of a chain-driven pump mounted in the base of the machine, beside the motor. The oil from the die head is returned through a strainer to the pump and used over again.

Simplicity of the automatic die heads is another feature emphasized. Automatic compression springs open and close the dies and the heads are adjusted to the size bolt to be cut by pulling the control lever forward. An automatic trip lever gives the operator



Complete Control from Either Side Is Provided. The driving motor is inclosed in the base

instant control, a light push automatically disengaging the die head without necessitating shutting down the machine. The trip rods on the carriages disengage the die head automatically after each threading job. By loosening the locking screw the dies for either head can be removed and changed in a few seconds, without removing the large die holders. If one die is snipped it can be replaced without removing any other die from either head.

The mid-winter meeting of the Eastern States Blast Furnace and Coke Oven Association is to be held Friday, Feb. 17, at the William Penn Hotel, Pittsburgh. In the morning there will be separate round table discussions of blast furnace and of coke oven topics, while the afternoon session will be devoted to topics of joint interest to blast furnace and coke oven operating men.

A. E. Kelly, New York district representative of the Donner Steel Co., Buffalo, in the sale of pig iron, will move his office on Feb. 1 from 2 Broadway to 39 Cortlandt Street.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

GENERAL BUSINESS OUTLOOK

Favorable Factors

1. The P-V line continues to rise.
2. Unfilled orders increased more than usual in December.
3. Commodity prices average firm to rising; pig iron markets stronger.
4. The farm situation is favorable.
5. Retail trade gained in December and was above normal.
6. Building activity is well maintained.
7. Money is still easy; Federal Reserve ratio recovers.
8. Continued caution in business.
9. Continued strong financial position of most leading companies.

Unfavorable Factors

1. Bank credit is over-extended in the direction of the security markets; brokers' loans large.
2. A rising trend in money rates is seen in the recent advances in time loan and bank acceptance rates.
3. Considerable unemployment exists and reduced purchasing power of factory laborers.
4. Small business profits.
5. Decline in December exports.
6. Large manufacturers' physical inventories, on the average.
7. Disturbed political conditions.

SUCH favorable factors as those above are the more fundamental as affecting industry and business. The more "barometric" indications promise business expansion during the first half of the year, but some financial readjustments will probably be required and may occasion irregularity.

Ingot Output Responds to P-V Line

STEEL production has gained, following by about seven months a rise in the P-V line. This is a rather slow response, but about the same period of time elapsed between the upturn of the P-V line in 1921 and the beginning of expansion in steel production in August of that year.

The rise in the P-V line means that the supply of commodities has been so reduced in comparison with the demand that markets are, on the average, stronger. The measurements used for determining the relative position of demand and supply are broad and general and apply necessarily only to the average condition. But we have supposed that the iron and steel industry is so broadly related to industry in general that the indications of the P-V index would apply to it. Experience thus far has justified this supposition.

At present, for example, a long period of curtailment in the railroad equipment industry and in automobile manufacturing has so reduced supplies that the technical position of the markets for these commodities is stronger. Temporarily, at least, the demand has increased and is stronger relatively to supply. Surpluses have been reduced. Current additions to supply are small. Buyers have waited and have used up or have allowed to become obsolete the units they are now operating. The situation is thus stronger. These two items of manufactured products are largely made of steel and the steel makers benefit by the situation.

Much the same may be said of hundreds of manufactured articles. Even building operations in many lines have been sufficiently readjusted, and for a long enough period to suggest that at least a normal volume is to be expected.

Less Active Demand in Later Months

As to the more distant future, it will be noted that the P-V line is "tapering off." In the course of time, as industrial activity expands, supply will gain on demand and the intensity of demand will ultimately decline. Judging by the past, there will eventually come another period of curtailment. Steel makers, like other producers, will some time find themselves turning out more products than buyers will take at profitable prices. This condition will probably be anticipated several months in advance by the P-V line. As yet, the trend

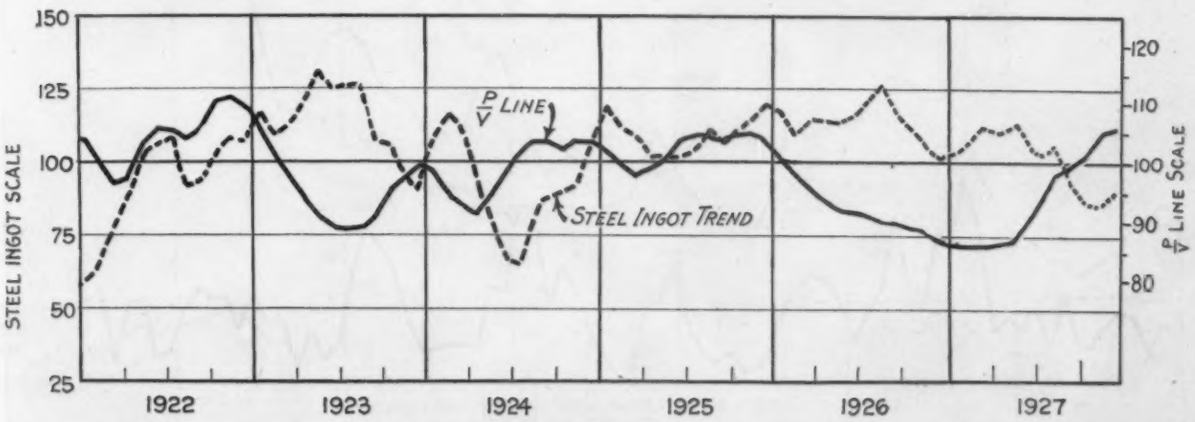


Fig. 1—Upward Movement of the P-V Line (Representing the Ratio of Commodity Prices to the Physical Volume of Trade) Has Continued for Eight Months. Steel production has responded sluggishly and good tonnages, with better prices, may be expected for some time

of that line is upward and seems likely to continue so for another month or two.

Even when it begins to decline there will be a period of several months before the results are apparent in business. The point is that *the basis seems to have been established for at least six months of expanding steel production.* We would guess that the industry might go ahead until August, at least. But much depends on the moderation of operations: The slower the steel makers are to expand operations in excess of the current requirements of steel consumers, the longer the rising trend—also the more satisfactory the market prices.

Aside from the inevitable hazards of foreign complications and domestic political developments, the chief uncertainty in all this reasoning lies in the financial situation. Any great tightening in bank credit, attended by a serious decline in security markets, would naturally react unfavorably on business. At present there are some indications that bank credit is tightening. Time loans have risen and the bank acceptance rate has been marked up one-eighth. The Federal Reserve banks have sold a considerable quantity of Government securities, which tends to bring firmer money markets. For some months the Federal Reserve ratio has shown a declining trend.

Incidentally, the security markets have been hesitant of late, if not slightly reactionary. But we are impressed with the localized character of the financial trouble. The inflation has been confined to the security markets and credit is not really tight. There is no indication that any drastic curtailment of bank credit will be required to check speculative excesses. In short, while firmer money is probable, the present outlook is for no such advances in money rates as would operate as a check on business.

Not until business expands sufficiently (1) to bring its requirements up to a point where funds will become scarce and (2) to bring production to a point where there are prospects of over-supply markets and declining dividends, are we likely to see any prolonged major financial recession. At present no such expansion exists and credit strain is potential and prospective rather than actual. It is possible that business expansion may proceed without much retardation from the financial situation.

Buoyant Indications of Several Elements

EVERYTHING in the second chart points upward. In the first place, and most important, the unfilled orders barometer (which is the rate of change in the monthly unfilled orders of the Steel Corporation), has risen sharply. Being above the base line, this means an actual increase. The sharpness of the increase is obvious and is the more noteworthy in that the usual percentage of gain for December is not counted. The gain, allowing for seasonal variation, is the sharpest since that which occurred in November, 1924. It contrasts with a decline in December, 1925, and again in December, 1926.

Such gains in unfilled orders, both logically and in fact, have usually accompanied rising prices for steel. The suggested rule appears to be without exception, when the trend of unfilled orders is backed up by a corresponding trend in scrap prices. Heavy melting steel scrap at Pittsburgh averaged $15 a ton in December, against $14.19 in November, and got as high as $15.50 toward the end of the month. This would seem to be a confirmatory trend. Thus far in January, however, scrap prices have weakened somewhat and at present are back to $15. The relapse is due probably to speculative conditions. The expansion in steel production and the firmer tone in pig iron markets seem to indicate that, in spite of some irregularity, scrap prices will move up during the next few months. If this conclusion proves accurate, we have advances assured in both scrap and unfilled orders, and indications of further improvement to come in the steel industry are strong.

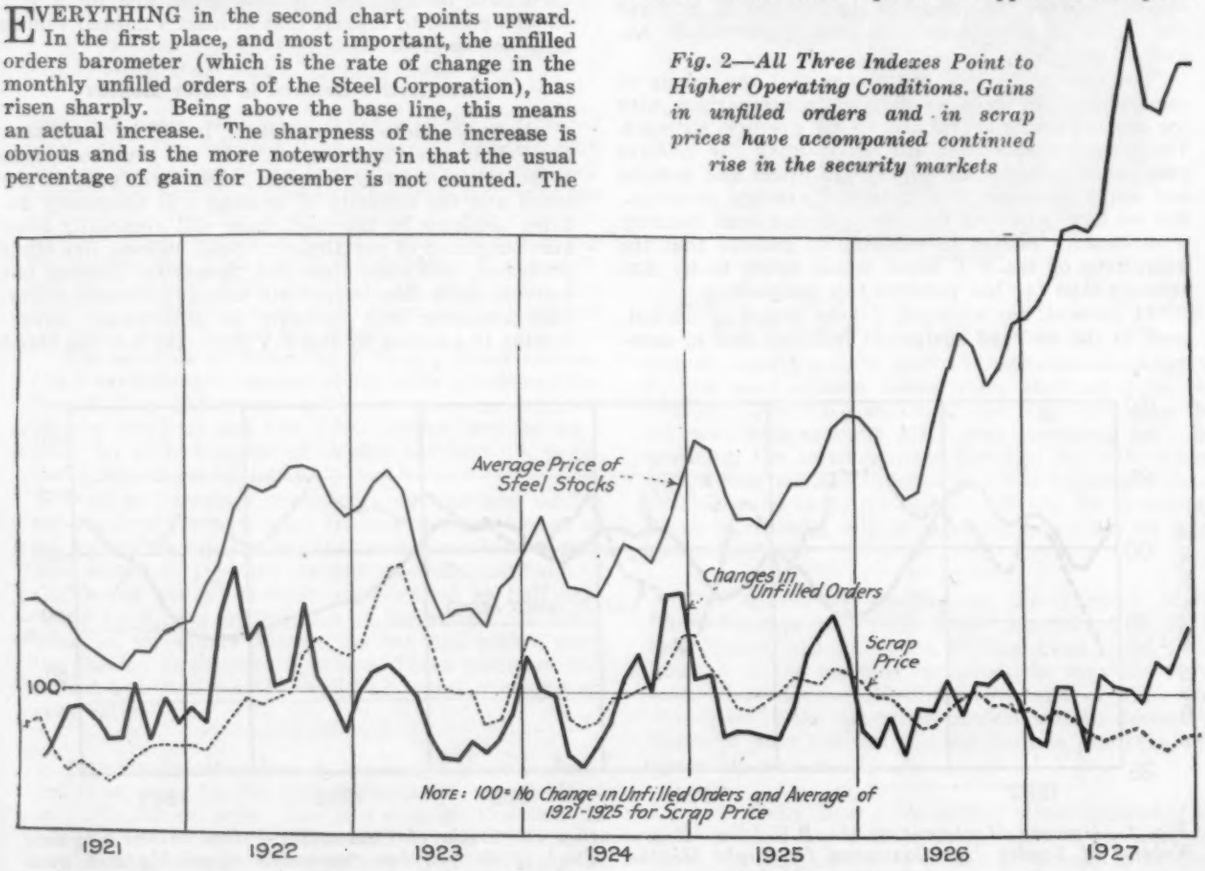
The action of a representative group of steel stocks has been influenced by the general speculative situation. The stock market has been adjusting itself to the uncertainties of the credit situation and steel stocks have moved in sympathy. Judging by the foregoing barometers, the sounder steel issues are likely to do somewhat better than the average of other stocks, and to show strength, pending more decidedly unfavorable developments in the money market.

Retail Trade Outstripping Wholesale

FURTHER grounds for assurance as to business are seen in the third chart, which shows the relative positions of industrial production, wholesale trade and retail trade. The most favorable item is found in retail trade, which made a good recovery in December. It increased much more than usual for the season and, except for the August peak, is at the high point of recent years. This increase in retail sales is marked in the case of the mail order business, while department store sales have barely held at the normal level.

While retail trade has picked up, the trend of industrial production continued downward through December. This is particularly true of *quantity* of production. When current prices are applied to the quan-

Fig. 2—All Three Indexes Point to Higher Operating Conditions. Gains in unfilled orders and in scrap prices have accompanied continued rise in the security markets



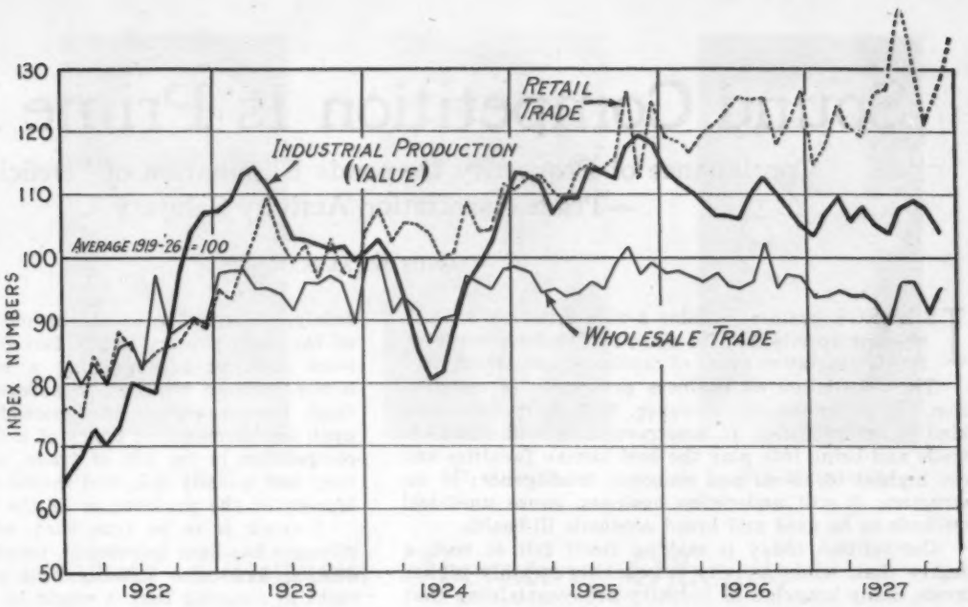


Fig. 3—Favorable Indications Are Seen from the Relations of Retail Trade, Wholesale Trade and Industrial Output. Retail trade has gained more largely than usual. Wholesale business continues slow, while industrial production is a little above normal

tity of industrial materials produced, we find that the curve of industrial production *value* is moving irregularly and that the trend during the past year has been rather "sidewise." This in itself suggests that production is not badly out of line with demand, since the markets for industrial products are strong enough to allow prices to be maintained. Moreover, the production value curve is so much below the retail sales curve that its position in this respect tends to support the foregoing suggestion.

Wholesale sales, however, are relatively low, in spite of the gain which occurred in November.

Employment in Ohio Showed Little Change in December

December employment reports from 64 Ohio foundries and machine shops disclosed practically no change from November, although there was a decline of 14 per cent from December, 1926. Increases in Cincinnati, Cleveland and Columbus were offset by decreases at Dayton and Toledo, while Cincinnati was the only city showing an improvement over December, 1926. Twelve Ohio steel works and rolling mills showed a continuation of the decline which started in June, employment being 4 per cent less than in the corresponding month of 1926 and 20 per cent less than in May, the peak month of 1927. Among automobile and automobile parts manufacturers there was an improvement in employment in December for the first time since May, 1927. The betterment amounted to 28 per cent compared with November, but showed a loss of 11 per cent from December, 1926. The reports are received monthly by the Bureau of Business Research of Ohio State University for publication in its bulletin.

Protest Tin Plate Freight Rate Between California Cities

WASHINGTON, Jan. 24.—A protest has been filed with the Interstate Commerce Commission by the California Transportation Co. and the Sacramento Navigation Co. against a suspended rate of 9c. per 100 lb. on tin plate, in minimum carloads of 80,000 lb., to Sacramento from San Francisco and Oakland, Cal., and certain intermediate points. The rate of 9c., suspended until May 10, was proposed by the Western Pacific Railroad. The existing rate from San Francisco is 18.5c., 36,000-lb. minimum. The protestants state that the Western Pacific Railroad staked its case on the "asserted belief that the United States Steel Products Co. would inaugurate its own barge service unless it reduced the rate." It is contended by the protestants that the type of steel barges owned by the Steel Products Company is not adapted to navigation on the Sacramento River and that that company could not possibly save over $1,250 per year if it established the service.

Blaw-Knox Co. Merges with Andrews-Bradshaw Co.

The Blaw-Knox Co., Pittsburgh, manufacturer of steel and iron products, buckets, machinery, etc., has concluded arrangements for a merger with the Andrews-Bradshaw Co., 530 Fourth Street, Pittsburgh, manufacturer of steam purifiers and other steam specialties. The latter company will retain its identity and will operate as a division of the Blaw-Knox Co. Grant D. Bradshaw will remain as president; L. F. Kuhman, vice-president, and R. W. Andrews, secretary and treasurer. Production will be carried out at the Blaw-Knox plant.

Timken Roller Bearing Co. to Spend $4,000,000 for Expansion

The Timken Roller Bearing Co., Canton, Ohio, has authorized an expenditure of $4,000,000 to be devoted to increasing the production facilities. The greater part of this expansion program concerns the company's plant at Canton, where both the steel mill and the bearing manufacturing plant will be considerably enlarged. Among other features a new substation of greater kilowatt capacity will be built for supplying electric power for both the steel mill and the factory. The contracts for steel construction alone amount to $300,000 or more.

Schedule of the next installments of the ***Business Analysis and Forecast****, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Feb. 16****—Activity in Steel Consuming Industries;* ***Feb. 23****—Position of Iron and Steel Producers;* ***March 1****—General Business Outlook.*

Sound Competition Is Prime Need

Continuance of Prosperity Demands Elimination of "Deficiteer" —Trade Association Activity Salutary

BY MAGNUS W. ALEXANDER*

IS LARGE business volume a safe criterion of business prosperity and is growing business competition a conclusive proof of decline in our prosperity?

The foundation of business prosperity is competition. It is important, however, that it be the right kind of competition. If constructive, it will stimulate trade and bring into play the best human faculties and the highest technical and economic intelligence; if destructive, it will undermine business, cause unethical methods to be used and breed economic ill-health.

Competition today is making itself felt to such a degree that, while activity is reaching steadily higher levels, many branches of industry are complaining that theirs is a "profitless prosperity." The fact is that in recent years about two in every five manufacturing corporations have either made no profits or have incurred a deficit. Analysis by the research staff of the National Industrial Conference Board of income tax returns to the Federal Government shows that in 1920, 37 per cent; in 1921, 54 per cent; in 1922, 41 per cent; in 1923, 37 per cent; in 1924, again 41 per cent, and in 1925, 39 per cent of all manufacturing corporations reported no net income. During these six years, for every $100 earned by successful concerns, $32 was lost by the unsuccessful corporations.

The board's analysis further shows that manufacturing corporations in 1925 not only operated on a distinctly narrower profit margin per dollar of sales than in 1923, the last previous "good" year, but that the average net income of 99.89 per cent of them—that is, all those with less than $5,000,000 net income in the year 1925—was nearly 11 per cent smaller than in 1923.

The reports of earnings during the second quarter of 1927 of several hundred corporations are now available. An examination of these shows that a few outstanding organizations are doing better, but by far the majority show a profit rate that is below what they were earning in the same period during 1926.

In certain lines, goods have actually been placed on the market at below production costs. This naturally stimulates a far-reaching question: Is it economically sound or socially desirable that over a consecutive period of time goods be sold without profit or at a loss? And this leads to a further observation of some interest. During the world war the word "profiteer" was coined. Has not the time come when in the same way we should hold up to scorn the "deficiteer," the man or organization who, either counting upon ability to withstand losses longer than some competitors or in ignorant or willful disregard of consequences, sells at a price below what the commodity is fairly worth or even below production cost?

Many trade groups, awakening to the seriousness of the situation as it has confronted them in their particular industrial branches, have been attempting through education in cost accounting to teach producers how to fix fair selling prices. Others, through the establishment of business standards and codes of ethics, are aiming to develop a moral plane of fair dealing that will put a stigma upon the individual or organization that indulges in unfair trade practices. Business men themselves have been urging the wisdom of restraint so as to assure a sustained period of moderate prosperity in preference to brief periods of boom prosperity with their inevitable grief. It is significant indeed that within the last year the chairman of the Federal Trade Commission has appealed for authority to add to the commission's powers by permitting it to prevent uneconomic, as distinguished from illicit, practices. Certainly, the experience of the petroleum industry and of the coal industry in the last few years has emphasized that we are reaching a stage when collective action may be required to safeguard basic industries from disorganization and possible disaster following upon the shortsighted policy of a few producers. While competition is the life of trade, it should be economically and socially fair, and should not be tainted by the leprosy of the profiteer or of the deficiteer.

I think it to be true that, while the competitive struggle has been increasing, the standards of business dealing have also steadily been elevated. Am I not right in claiming that it would be considered unethical today to do things which a generation ago would have been justified as measures of self-defense in business—such as "knocking your competitor's product," or "shading" in a secret transaction the established price to a few of one's customers, or "spying" on a competitor's salesmen, or "enticing away" customers unfairly?

I think the influence of the trade association movement in setting and maintaining those higher standards of business conduct generally, which have heretofore had to depend more on the personal honor of a few and the influence exerted by them, has been the most potent single factor in this transformation. Many of the trade associations have not only given clear definition to the guiding principles of business morality, but they have brought the steady pressure of group opinion to bear upon their enforcement. They have cleared the field for the rational determination of business policies, without enjoining the sacrifice of independence. They have done this especially by assembling reliable, trade-wide statistics upon all aspects of current conditions concerning which information is essential to the formulation of sound judgment. They have eliminated ambiguities from trade terminology and standardized collateral features of ordinary commercial transactions.

The immediate outlook is for more, rather than less, business competition. This should not frighten, but should stimulate us. It should make us apply scientific methods and intelligence wherever possible, prevent waste and inefficiency, improve and invent for the more effective satisfaction of the rising demands of the people and for the release of human labor where practicable, and train labor for more skilled tasks, staff personnel for efficiency, and executives for managerial capacity.

If, as claimed, sound competition is the cornerstone of business activity and thus the road to the achievement of a stable and prosperous condition of business, so a prosperity that permeates the country widely fosters and makes possible a healthy and stimulating competition. A high social service is, therefore, being rendered by keeping competition sound and prosperity widely diffused, for in the state of business and of competition are bound up the fortunes and well-being of the people of the United States.

Present conditions contain a challenge, but the challenge is essentially to the business men. Such challenges are not new in our national economic life. We have overcome similar problems before. We ought to be able to overcome them again. If it is true, as some assert, that there is more business genius in the United States than elsewhere in the world, that genius ought to be applied to the betterment of the business organization and to the development of such standards of business conduct as will bring forth the best of which management is capable. It will then be more fully recognized that competition and prosperity in business are compatible factors and not antagonistic forces and that, even under keenly competitive conditions, there can be a substantial business prosperity.

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*President National Industrial Conference Board, New York. Abstract of address before Michigan Manufacturers' Association, Detroit, Dec. 8, 1927.

R. J. WYSOR

F. E. FIEGER

J. Z. COLLIER

S. S. MARSHALL

New Jones & Laughlin Operating Officials

R. J. WYSOR, since 1925 assistant general manager of the Jones & Laughlin Steel Corporation, Pittsburgh, has been made general manager of all works and properties of the corporation, succeeding T. M. Girdler, the corporation's new president. Mr. Wysor's successor as assistant general manager is Frederick E. Fieger, for the past five years general superintendent of the Aliquippa works, Woodlawn, Pa. J. Z. Collier, who has been general superintendent of the South Side works, Pittsburgh, becomes head of the Aliquippa works, and is succeeded by S. S. Marshall, Jr., who has been assistant general superintendent of the South Side plant. H. D. Stark takes the position vacated by Mr. Marshall.

Mr. Wysor was born in Dublin, Va., in 1885, and received his technical training at Virginia Polytechnic Institute, Blacksburg, Va., from which he was graduated in 1906. For the next four years he was chemist and assistant chief chemist at the Duquesne works, Carnegie Steel Co. Leaving that company in 1910, he was for two years engaged as metallurgist for the Panama Canal Commission and then joined the Bethlehem Steel Co., serving for four years as chief chemist and engineer of tests, for two years as superintendent of blast furnaces and for one year as superintendent of the service department at the Bethlehem works. From 1919 until 1923 he was assistant general manager of the Maryland plant, Sparrows Point, and with the acquisition of the Midvale Steel & Ordnance Co. by the Bethlehem company in 1923, he was transferred to the Cambria works, Johnstown, Pa., as assistant general manager. He joned the Jones & Laughlin corporation in 1925 as assistant general manager.

Mr. Fieger is a native of Pittsburgh and has been with the Jones & Laughlin corporation since 1917. His connection with the steel industry began in 1901, when he went to work in the engineering department of the American Tin Plate Co., which later was merged with the American Sheet Steel Co. into the present American Sheet & Tin Plate Co. He left that company to engage in consulting engineering in Pittsburgh in 1909. In 1913 he joined the Whitaker Glessner Co., Portsmouth, Ohio, as chief engineer, and two years later became general manager of that plant, which is now the Portsmouth works, Wheeling Steel Corporation. He became superintendent of the wire department, Aliquippa works, Jones & Laughlin Steel Corporation, in 1917. A year later he was made superintendent of steel works, in 1920, assistant general superintendent, and in 1923, general superintendent of the Aliquippa works.

Mr. Collier, who was born in Atlanta, Ga., in 1887, was graduated from the Georgia School of Technology in 1906 and in 1907 went to Pittsburgh to enter the employ of the Westinghouse Machine Co. He joined the Jones & Laughlin organization in 1918 as assistant chief engineer at the Aliquippa works and later served as steel works and blooming mill superintendent. He was appointed assistant general superintendent at the South Side works in 1923 and general superintendent on Jan. 1, 1926.

Mr. Marshall's experience has been solely with the Jones & Laughlin corporation, with which he has been identified since 1903, when he went to work in the engineering department of the Eliza Furnaces, Pittsburgh. Later he became superintendent of construction for works on the north side of the Monongahela River and still later, general master mechanic of the Soho department. He was made assistant general superintendent at the North Side works in 1917 and assistant general superintendent of the South Side works in 1925.

George M. Laughlin, Jr., Elected Chairman of Jones & Laughlin

George M. Laughlin, Jr., vice-president Jones & Laughlin Steel Corporation, has been elected chairman of the board to succeed the late B. F. Jones, Jr. Mr. Laughlin, who was born in Pittsburgh, is a son of the late Major George M. Laughlin, one of the early partners in the business, who was actively connected with the organization until his death in 1908. The new chairman attended St. Paul's School, Concord, N. H., and Yale University, joining the steel company in 1893 in the operating division, where he continued in various executive positions until he became a vice-president in 1921. Some years prior he was made a director and member of the executive committee.

To Install Recuperator for Bar-Heating Furnace

A Rust refractory recuperator is to be installed in conjunction with a bar-heating furnace at the plant of the Steel Co. of Canada, Ltd., Hamilton, Ont. The furnace will be provided with a perforated arch through which highly preheated air from the recuperator will enter the combustion chamber, mixing with the coke oven gas which will be used as fuel.

After passing through the furnace, the waste gases travel downward to the recuperator, which is situated beneath the furnace. The gases then pass horizontally through the recuperator waste gas flues and thence to the stack.

Air for combustion enters the recuperator at the bottom and passes vertically upward through the air flues in refractory tile. From the recuperator the preheated air is led upward to the perforated roof and enters the furnace chamber at this point.

Column construction is used in building the recuperator, each tile being ground at the top and bottom to make a positive gravity seal. The work is to be done by the Rust Engineering Co., Pittsburgh.

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January 26, 1928

This Issue in Brief

Greater sales volume at the expense of profits. Though volume output reduces production costs it also tends to lower prices, and prices and profits have declined faster than it has been possible to reduce manufacturing costs. Selling prices are bound to suffer so long as operating heads are permitted to press sales departments for more business as a means to lower costs.—Page 282.

Steel has not lost in competition with cement. Structural steel shipments have increased steadily since 1913. Shipments of 1927 more than doubled those of 14 years ago, while the gain in Portland cement shipments relatively was not so great.—Page 283.

Welsh tin plate industry plans to spend $5,000,000 on modernization. Will adopt American methods, realizing that they must do so or be driven out of world markets.—Page 270.

Old-fashioned beer bottle gives way to stainless steel container. German brewers find that the quality of the beer is not affected by Krupp stainless steel "V2A." Containers are collapsible, occupy less room than bottles, and are more durable.—Page 311.

Praises trade associations for their wholesome influence on business. They have been the most potent single factor in the raising of standards of business conduct, says head of National Industrial Conference Board.—Page 278.

Lower zinc prices due chiefly to increasing application of differential flotation. Shrinkage of one-third of value in less than two years is ascribed to low cost of producing electrolytic zinc from complex ores by the new process.—Page 282.

Labor cost reduced 50 per cent by mechanical sheet pack opener. New machine enables three men to do the work formerly done by six.—Page 271.

Competition and prosperity are compatible. The prospect of greater, rather than less, competition should not frighten, but should stimulate business, says chief of National Industrial Conference Board. But competition must be sound, which demands the elimination of the "deficiteer," he who sells at a price below what the commodity is fairly worth.—Page 278.

Good forgings can be made with a three to one reduction from the ingot. Locomotive builder finds that the five to one reduction, a trade practice of long standing, is not necessary. The use of the smaller ingot reduces the tendency for segregation.—Page 258.

Drastic curtailment of bank credit to check speculative excesses will not be required, economist believes. While firmer money is probable, the present outlook is for no such advance in money rates as would operate as a check on business, says Dr. Haney.—Page 276.

Saves 46 per cent of power cost in rolling mill operation by using anti-friction bearings. Power cost on 16-in. three-high breakdown mill with plain bearings was $8,029 per annum, and $4,335 when roller bearings were used.—Page 260.

Reduces cost of lubricating hot saws by applying anti-friction bearings. Where grease is the lubricant, the ratio is about one to ten in favor of the tapered roller bearing, says bearing manufacturer. Even where oil is used, the improvement is considerable.—Page 262.

Billionth of an inch measured by photoelectric device. New invention registers a change in length of metals, under higher temperature, as small as one-tenth of the diameter of an atom.—Page 263.

Fewer motor vehicles made in 1927 than in any other year since 1922. The total of cars and trucks produced was 3,393,887, which was 21 per cent under 1926.—Page 312.

Enameling costs reduced by use of automatically controlled conveyors. Power conveyors of the roller type carry the ware into the dryers after spraying.—Page 266.

Scrap prices will move up during the next few months, Dr. Haney believes. This is indicated, he says, by expansion in steel production and firmer tone in pig iron markets.—Page 276.

Gain of 2.6 per cent in by-product coke capacity in 1927. The 12,756 ovens now built or under construction have a capacity of 83,826,638 net tons of coal annually, giving an estimated yield of 58,555,726 tons of coke.—Page 268.

Straight anneal of heavy forgings will not produce a desirable grain structure, says locomotive builder. He declares that the terrific strains set up in quenching make it necessary to normalize and anneal.—Page 258.

Finds deep-etch test invaluable in guarding against acceptance of questionable steel. Forging manufacturer believes that this test is the only one which will detect thermal ruptures produced during casting, reheating or blooming mill work.—Page 257.

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Competition and Business Volume

THE cure for too much competition is not more competition. However, it is one thing to counsel restraint in competition and another to practice it. Every manufacturer is confronted with the need for business and will not relax his efforts to get it so long as there is danger of losing ground to competitors. Moreover, it is natural for him to feel that he is on the defensive and unable as an individual to change a market situation until others take the initiative.

One result of the keenness of competition has been the reduction of costs through increases in production. To obtain a greater volume of business, installment selling has found wide adoption. Yet even with the aid of mass output, made possible by enabling the public to anticipate its buying power, prices have declined faster than it has been possible to reduce manufacturing costs.

It is beginning to be realized that increased volume of business is not the solution of the manufacturer's difficulties. Other ways of reducing costs are being sought. The present tendency toward consolidations is one manifestation of this effort. More attention is also being given to the possibilities of introducing manufacturing economies without expanding production.

That much can be done in this direction is indicated by the advances made in the technique of tanning leather, the output of which is limited by the available quantity of hides. Even where the supply of raw material is not a factor manufacturers are looking for operating economies that are not dependent on larger production. A leading automobile manufacturer some years ago purchased a site for a body factory, but deferred construction because his existing plant facilities were not fully employed. Finally, he succeeded in rearranging operations so that the body works might be housed in the present plant, thus obviating a heavy investment in new construction.

The automobile industry, which has been conspicuous in developing mass production methods, is well aware that there are definite limits beyond which the volume of business cannot be economically expanded. Although it is increasingly cautious in adding plant capacity, its problem is complicated by a fickle market. The models of a given manufacturer may capture the fancy of buyers one year and prove unpopular the next. As a result, there is an uneven demand on the industry, and companies pressed to fill orders are tempted to make excessive investment in equipment and plant.

The situation in the automotive field is cited to show that there is no simple solution of the problem confronting industry today. The policy of the individual manufacturer from day to day will continue to be dictated by realities, not by mere theories. Much will be gained, however, if he stops seeking volume for volume's sake. So long as operating heads are permitted to press sales departments for more business as a means to lower costs, selling prices are bound to suffer.

Zinc on the Toboggan

METAL producers have been worried over the steady decline in lead and zinc prices going on ever since January, 1926. Some rather heroic measures have been taken by the zinc people, even to the limitation of output by Oklahoma miners, but to little avail. From a high of 9.04c. per lb. for November, 1925, the price of prime Western spelter in New York has declined until during the current week it was quoted below 6c. Here is a shrinkage of one-third in value in a little over two years. When is it going to end?

It appears that, despite the continuous growth in world's consumption of zinc, the world's supply of metal—or of high-grade concentrates ready to be changed quickly into metal—has increased even

faster. Most worthy of note, for it indicates the cause of the above situation, is the rapidly spreading application of differential flotation to the treatment of complex ores. The high-grade zinc concentrate so made, excessively fine in particle size, is converted to metal much more easily via the electrolytic tank than via the retort. Furthermore, the flotation concentrates are produced mostly in mountainous regions where fuel is dear but water-power plentiful. Hence the growing output of electrolytic zinc and the stagnant condition of the retort plants.

Thus zinc is going through one of those recurrent periods in industrial history when new discoveries in methods of production make available a larger output than the world needs at the time. New uses to consume the surplus are yet to be discovered. We cannot doubt that this extra zinc will be absorbed and put to useful work, but it will take time. Meanwhile over-production, or the threat of over-capacity, will tend to depress the selling price.

Electrolytic zinc has been likened by some to electrolytic copper, and drawing on such a supposed analogy, predictions have been made that retort zinc will disappear. But the cases are not parallel. Electrolytic copper is needed because the electrical industry, the principal copper buyer, requires great purity in its metal for carrying current and only electrolytic refining can give that great purity. On the other hand, zinc of high purity had to fight for its market. In a copper refinery, impure anodes of Bessemer metal are refined with the consumption of relatively little current. In an electrolytic zinc plant, the roasted ore is leached, the solution purified and the zinc deposited from the electrolyte, but only at the expense of much electric energy. With such handicaps, the amount of electrolytic zinc reaching the market from its first appearance in 1916 has been rather moderate, and only from those places where ample power and suitable ore existed side by side.

Differential flotation upset this balance in 1926 and 1927. There are available in many mining districts great tonnages of complex sulphide ore containing lead, zinc, copper, iron, silver and gold, in all combinations of percentages. Even though the total of the metals contained in such an ore is large, it could not profitably be smelted for any one of them. But now a separation can be made into clean lead, zinc and copper sulphides which can be shipped to separate smelters, and good recoveries are made on all the metal content. Obviously when the mining and concentrating charges are divided among the three metals, and the precious metals credited, the cost per pound of making either the copper, lead or zinc turns out to be less than for pure ores of any of the metals smelted direct in the old way.

Trying times are ahead of the high-grade zinc mines, strange as it may seem, for the commanding position in the market will be taken by what in effect is "by-product zinc." Operators in well established Oklahoma camps can meet and agree to curtail their production, but it would be as hard as stopping a gold rush to get the rejuvenated mines in the Rocky Mountains to forego their long awaited bonanza profits—at least until they have had some years of prosperity and acquire a perspective.

Steel and Cement Consumption

THAT the production of Portland cement has increased much more in the past 15 years than the production of steel is a fact that presumably is generally recognized. Any inference that the gain has been at the expense of steel is erroneous. In a general way it may be said that construction work has come to represent a larger proportion of our total industrial activity than formerly. Since 1913 there has been substantially the same increase in ton-mileage of freight movement as in the total production of steel, but both the quantity of structural steel fabricated and the quantity of Portland cement manufactured have increased in much greater ratio. They have approximately doubled since 1913, while the gains in freight movement and total steel production have been less than 50 per cent. The increase in construction work has swelled the output of structural steel and cement alike.

When cement is thought of as a competitor of steel, fabricated structural steel is particularly in mind. It is acknowledged that the use of other forms of steel is stimulated by the increasing employment of cement. A direct comparison of the consumption of fabricated structural steel and Portland cement is therefore strictly in point and reasonably conclusive. Such a comparison is made below for the 15 years beginning with 1913. The first column of the table shows lettings in net tons of fabricated structural steel through 1923 and the shipments of the fabricating shops in subsequent years, compilation of statistics of shipments having begun only with 1924. The second column shows the shipments, in barrels, of Portland cement. The third column gives for each year the number of barrels of cement per ton of fabricated structural steel. The index for 1913 was 70.3, and none so high was shown afterward except for the off-year 1921, when cement dropped only a trifle while steel dropped a great deal.

	Fabricated Structural Steel Net Tons	Portland Cement Shipments Barrels	Barrels Cement to 1 Ton Steel
1913.....	1,260,000	88,689,377	70.3
1914.....	1,266,000	86,437,956	68.2
1915.....	1,797,600	86,891,681	48.2
1916.....	1,838,160	94,552,296	51.5
1917.....	1,663,200	90,703,474	54.5
1918.....	1,639,680	70,915,508	43.2
1919.....	1,602,720	85,612,899	53.5
1920.....	1,684,800	96,311,719	57.1
1921.....	1,113,000	95,507,147	85.6
1922.....	2,112,960	117,701,216	55.7
1923.....	2,188,800	135,912,118	62.0
1924.....	*2,411,390	146,047,549	60.5
1925.....	*2,796,090	157,295,212	56.2
1926.....	*2,842,920	162,187,090	57.1
1927.....	*2,626,680	170,922,000	65.0

*Shipments; figures for previous years are for lettings.

It may be mentioned as a detail that consumption of cement increased slightly more than is indicated by the record of shipments, by reason of increased imports and decreased exports, but the difference is not sufficient to alter the fact that in recent years fabricated structural steel has had a higher ratio to cement than in 1913 and 1914.

The foregoing comparison, while favorable to

steel, does not tell the whole story. The use of cement in road building and on the farm has greatly increased, these two classes accounting for nearly, if not quite, one-half the total cement consumption. Cement thus used does not take the place of structural steel, but does stimulate the use of other forms of steel, including in particular reinforcing steel, while it also calls for the construction of much machinery.

Relative Coal and Gas Consumption

REFERENCE was made in THE IRON AGE of Jan. 12 to the almost stationary rate of coal production, the annual gain in the past dozen years having been only about 1 per cent. The smallness of the gain, while the requirements of the country have been increasing greatly, is due, as indicated, to improvements in methods of utilization. It is of interest to measure in a general way the saving in coal that has been made by the use of gas, this being entirely distinct from savings effected by burning coal more advantageously for heating and power purposes.

Approximations can be made sufficiently close to indicate the general relationships between coal and the different forms of gas. The measure is necessarily in British thermal units.

Last year's coal production, bituminous and anthracite in the United States, was approximately 600,000,000 net tons. In round figures about 21,000,000 tons was exported, 5,000,000 tons was used directly in the manufacture of coal gas and about 74,000,000 tons was used in making beehive and by-product coke. This left 500,000,000 tons as used direct for the production of heat, in steam raising, melting, heating buildings, etc. This amount of coal represented approximately 13,000 trillion B.t.u. This figure furnishes a convenient quantitative reference for measuring gas fuels.

Surplus coke oven gas, for use outside the ovens, supplied about 215 trillion B.t.u., and coal, oil and water gas about 150 trillion. Natural gas can be estimated only roughly, as returns are slow on its production; but a fair approximation is 1300 trillion B.t.u. There is a total of 1665 trillion B.t.u., which is about one-eighth as large as the heat involved in the 500,000,000 tons of coal used direct.

For a complete count of our thermal disposition petroleum should also be considered. Its production represents slightly more than one-fifth of the total thermal equivalent of the fuel we get from the ground; but the thermal units directly consumed cannot be estimated closely with data now available, because there are large and varying imports and exports, and some petroleum is used in making the manufactured gas reckoned above. Suffice it to say that the readily produced supplies are expected to diminish in a few years. Afterward at greater expense more can be obtained and the working of oil shales will follow. Then, however, the cost will be much higher and it will be correspondingly more advantageous to push by-product coking much further.

As to progress by replacing beehive coking with by-product coking, that work is nearly completed, for last year less than 15 per cent of the total coke was beehive. The proportions were half and half only about nine years ago, for in 1918 and preceding years beehive largely predominated, while in 1919 and following years by-product has been predominant. The fact remains, however, that by-product coking is still pursued chiefly for the production of coke for metallurgical purposes, gas being a by-product. For producing coke to be used as fuel by-product coking is still in its infancy.

Blast furnace gas has not been considered in this cursory examination of relationships. It is a large item in its particular field. Real technical progress may be made at any time in reducing the amount, for increasing attention is being paid to the point that the blast furnace looks too much like a gas producer.

Blacksmithing Skill Still Essential

RECENT articles in THE IRON AGE on the production of heavy forgings—especially the one by E. J. Edwards in the current issue—emphasize the fact that the fundamental considerations underlying sound forge practice are no different now than they ever have been. First get good sound metal; second, heat and forge it with skill; and third, cool it properly. The prime difference between the modern plants and the primitive smithy is that formerly the blacksmith regulated all these essential steps by relying upon his skill and his knowledge of the traditional lore of the art. Naturally the blacksmith and armorer was then highly respected for his accomplishments and his value to society.

In this day of specialization the functions of the blacksmith have been divided. An illustration can be drawn from the cutlery industry in Sheffield. This whole English industry depends upon the fundamentals listed above, but there the production of fine steel is in the hands of one group, the working of the blades is done by men whose fathers have been smiths for generations back, and the final hardening, grinding and polishing is done by still another group of experts who do nothing else.

Our present articles are interesting in tracing this development further; in showing how the technically educated chemist, metallurgist and mechanical engineer have assumed control of the forging operations, devised tests for sound steel, built correct furnaces, laid down proper heating and cooling programs, installed adequate temperature regulators and powerful machinery for handling and shaping the hot metal. The result is forgings of uniformity and quality unapproached in the olden days of control by tradition.

This does not mean that skill is no longer required. The hammer man, or forgeman, or blacksmith may be told when to withdraw a piece from the furnace by a clock and a pyrometer chart, but he still must know how to handle the piece most effectively, where to direct the blows, how often to turn the piece about, and when to stop the work either when it reaches the desired shape or becomes too cool. The manufacture of hollow forgings on a mandrel, such as pressure vessels, hollow shafts and gun tubes, is a matter of especially high art. This skill, coupled with great muscular

strength, is admirable, and makes the word "blacksmith" still a title of honor. It is regrettable that many of these men who know so much about forging are still in the wrought iron era of metallurgy and know so little about the heat treatment and properties of plain carbon steel, to say nothing of the important alloy steels.

For it is this ignorance which has militated against the wider adoption of high-strength heat-treated parts in locomotives. Even though progressive manufacturers are amply competent to produce such parts, the operating officials have not yet been able to insure them against abuse by the railroad engineers, repair men and blacksmiths who handle these machines subsequently. Obviously a heat-treated axle or side rod is a positive menace after having been straightened or heated for any reason by one of these old timers who have neither the equipment nor the knowledge necessary to reheat-treat the part correctly. Equally plain it should be to progressive railroad men that they will be unable to effect important economies so long as they permit this condition of inadequate repair knowledge to persist.

Barbour Stockwell Co. Buys Broadway Iron Foundry

Purchase of the Broadway Iron Foundry Co., Cambridge, Mass., by the Barbour Stockwell Co. of the same city is announced. The Broadway Foundry, established in 1864, was one of the pioneer foundries of Greater Boston. The plant will continue to be operated for the present, with Robert C. Bird as manager. Mr. Bird's father began this business during the Civil War. In 1895 his son, Robert, was made president of the company.

Eventually the plant will be dismantled and the business transferred to the Barbour Stockwell Co. plant. The latter now becomes, it is said, the largest general machinist and iron foundry business in New England. The foundry department will make castings in brass, bronze and aluminum, in addition to the regular production of gray iron and semi-steel. All the other departments—engineering, research, pattern, machine and instrument—will continue their usual activities.

Comprehensive Program Formulated for Power Transmission Association

The preparation of a practical handbook on the subject of mechanical power transmission is an important activity to be undertaken by the Power Transmission Association's board of advisory engineers, which is headed by William Staniar, transmission engineer of E. I. du Pont de Nemours & Co., Wilmington, Del. "While the theory has not changed there is a great difference in the design and present-day practice, which makes it very desirable to have an up-to-date reference book giving practical data on the use of our products," said W. H. Fisher, secretary of the T. B. Wood's Sons Co., Chambersburg, Pa., in his presidential address at the annual meeting of the association, held at the Hotel Commodore, New York, Dec. 7.

Publishing of information relating to the economies and efficiencies of the various mechanical power transmission methods, appurtenances and accessories was also recommended by the association's advisory engineers. This information would serve to point out the economy that can be effected by the efficient use of the group and direct methods of drive. It would aim to advise users impartially of the newest developments in equipment by which greater efficiency and economy may be obtained, and to emphasize the necessity of good engineering practice to simplify the transmission of power by the correct uses of equipment. It would also provide data regarding lubrication and general maintenance of mechanical transmission equipment, and information on obsolescence. Important general test data now in possession of individual members would be published for the benefit of the association and power users.

It was also recommended that a study be made of the best method of assisting users of transmission equipment in their efforts to obtain the best service, and eliminate losses from incorrect use or poor condition. The development of simple apparatus for testing alinement of shafting was suggested. In this connection it was thought that electrical manufacturers should provide a simple method for alining motors.

Another proposal was the publishing of a list, covering principal industries, showing representative good examples of the use of the various types of belting and transmission equipment. Promotion of standardization and simplification was advocated. It was suggested also that the American Society of Mechanical Engineers create a professional division or section of its present Power Division to provide a forum for the discussion of transmission problems.

Ask Modification of Decision in Consolidated Southwestern Cases

WASHINGTON, Jan. 24.—Modification of the decision of the Interstate Commerce Commission in the Consolidated Southwestern Cases is asked in a petition filed yesterday by the East Side Manufacturers' Association, made up of members of the industrial district of St. Louis, and by the Steel Consumers and Shippers' Conference, made up of scrap consumers in Arkansas, Louisiana, Oklahoma, Texas, Missouri and Kansas. The East Side Manufacturers' Association asks that the commission add spiral columns or column hoops, knocked down or collapsed; iron or steel joints for concrete road construction, and iron and steel pins and joists to a list of articles included in the finding. The scrap consumers ask that the report be modified to the extent that wherever rates are in effect upon a lower basis than those prescribed there shall be no warrant for an increase in such rates.

LeBlond Interested in Airplane Motors

CINCINNATI, Jan. 23.—Plans have been formulated by R. K. LeBlond to establish a plant at Cincinnati in which airplane motors for commercial type planes will be built. Whether the new plant will be a part of the R. K. LeBlond Machine Tool Co., or a separate division of it, has not been determined. Negotiations now are under way for acquiring the assets of the Detroit Aircraft Engine Co., which has been declared bankrupt. Glenn Angles, owner of the patents of the motors, and Robert Winters, both of whom have been associated with the Detroit company, have become affiliated with the LeBlond interests. The motors, which are of the radial air-cooled type, are somewhat similar to the Wright whirlwind engine and are to be made in two series of three sizes, ranging from a 50-hp. three-cylinder motor to a 165-hp. nine-cylinder engine.

Michigan Engineering Conference

The third Michigan Engineering Conference, sponsored by 23 engineering groups, will be held at the Hotel Statler, Detroit, Jan. 27 and 28.

The program includes addresses and papers on the relation of the engineer to management; welding; the X-ray as an engineering tool; commercial aviation, and electrification of steam railroads. Alexander Dow, president of the Detroit Edison Co. and president of the American Society of Mechanical Engineers, will preside at the afternoon session, Jan. 27.

Iron and Steel Markets

Plates, Shapes and Bars Advanced

Price Increase of $1 a Ton Expected to Drive in First Quarter Specifications—Structural Orders and Railroad Buying Feature Market

PRICE advances, heavier production and a further broadening of consumption are salient features of a stronger steel market.

Following an advance of $1 a ton on plates, shapes and bars, announced last Thursday by Steel Corporation mills, similar action has been taken by most independents. Since the new prices—1.85c. at Pittsburgh and proportionately higher quotations at other basing points—are limited to orders taken for delivery during the current quarter, the inference is that another advance is contemplated, with 2c., Pittsburgh, as a possible objective on second quarter business.

The initial effect of the higher prices will probably be a release of specifications against first quarter contracts, as well as the clinching of orders that were withheld pending additional signs of market strength. In fact, the volume of new business closed since Jan. 1 has probably been underestimated by the trade. Though heavy specifications were entered against expiring contracts in December and shipments against fourth quarter commitments are still being made, the gain in the Steel Corporation's unfilled tonnage this month promises to be substantial even though it fall considerably short of the sharp increase reported Dec. 31.

Construction work and railroad buying are conspicuous as sources of tonnage business. The week has been one of the largest on record in lettings of fabricated steel work, and it has added 100,000 tons to rail mill backlogs. The largest rail order, 40,000 tons, placed by the Rock Island, was divided, 35,000 tons going to the Gary mill and the remainder to the Indiana Harbor producer. Rail commitments of American mills, it is estimated, are fully 150,000 tons larger than at this time a year ago. Railroad equipment buying promises to continue to be an important market factor, with orders for 3000 cars from the St. Louis-San Francisco and 1000 from the Central of Georgia in early prospect. Steel specifications received from car builders by Chicago mills during the week total 13,000 tons.

Better farmer buying is reflected in the steel consumption of implement manufacturers, which is 10 per cent heavier than a year ago. There is a good flow of business from the automobile industry, although motor car output has not increased so rapidly as was anticipated. At Cleveland, demand for sheets and strip from stamping plants and other parts makers is not so heavy as earlier in the month, when liberal specifications for early needs were released. At Chicago, however, the automotive trade has passed the farm implement industry as the leading taker of bar shipments.

Demand for tubular goods lags, and pipe mill operations do not exceed 60 per cent of capacity. Steel mill output generally, however, has shown a further gain. Steel Corporation plants are running at 82 per cent of capacity, as compared with 78 per cent last week and 75 per cent two weeks ago.

Award of 57,800 tons of steel for the Cleveland Union Terminal to the Steel Corporation's fabricating subsidiary brought the week's total of structural contracts to more than 103,000 tons. Other outstanding lettings were 15,000 tons for a building in Boston, 8000 tons for a bank in Chicago and 7000 tons for subway work in New York. Among new inquiries for 23,000 tons is 7000 tons for a bascule bridge in Milwaukee.

Efforts of manufacturers of hot-rolled and cold-rolled strip steel to obtain higher prices are chiefly with an eye to second quarter business, since with few exceptions they are committed against probable production in this quarter. The objective of hot-rolled strip makers is 1.90c., Pittsburgh, for wide material and 2.10c. for narrow sizes, but orders for delivery in this quarter are being accepted at $2 a ton less. The advance of $3 a ton on cold-rolled strip, effective Jan. 25, has not been generally followed and, like the move on hot strip, is regarded as an aim for second quarter.

Following the advance of $1 a ton on hot-rolled bars, makers of cold-finished steel bars and shafting may soon announce an advance of $2 a ton in an attempt to obtain a wider spread between their raw material and finished product. Meanwhile, 2.20c., Pittsburgh, is being firmly maintained.

Pig iron markets are less active, as consumers are nearly all covered for their first quarter needs, but the week brought sales of 19,000 tons at Cleveland. Lake Erie iron is being offered in Chicago at slightly less than $18 for shipment by water when navigation opens, and slight weakness has developed in New England. At Birmingham, basic iron has declined $1 to $15.

Old material prices have not developed the strength that the scrap trade expected would result from increased operations at steel plants.

The competitive position of American steel in export markets has been favorably affected by growing firmness in European prices concurrent with the introduction of a shorter working day in German mills.

Exports of iron and steel in 1927 were 2,180,969 gross tons, a slight gain over the 2,167,213 tons of 1926. Imports fell off from 1,110,049 tons in 1926 to 750,467 tons in 1927, due largely to reduced incoming tonnages of pig iron. Tin plate was the largest export item in 1927, with 254,131 tons, and wrought pipe provided 248,415 tons.

No change occurred this week in either of THE IRON AGE composite prices.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Jan.24, 1928	Jan.17, 1928	Dec.20, 1927	Jan.25, 1927
No. 2, fdy., Philadelphia..	$20.26	$20.26	$19.76	$22.26
No. 2, Valley furnace.....	17.25	17.25	17.25	18.50
No. 2, Southern, Cin'ti....	19.69	19.69	19.69	21.69
No. 2, Birmingham.....	16.00	16.00	16.00	18.00
No. 2 foundry, Chicago*..	18.50	18.50	18.50	20.50
Basic, del'd eastern Pa. ..	19.50	19.50	19.50	21.50
Basic, Valley furnace....	17.00	17.00	17.00	18.00
Valley Bessemer, del'd P'gh	19.26	19.26	19.26	21.26
Malleable, Chicago*	18.50	18.50	18.50	20.50
Malleable, Valley	17.25	17.25	17.50	18.50
Gray forge, Pittsburgh...	18.51	18.51	18.51	19.76
L. S. charcoal, Chicago...	27.04	27.04	27.04	27.04
Ferromanganese, furnace.	100.00	100.00	100.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill.	$43.00	$43.00	$43.00	$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh....	34.00	34.00	34.00	36.00
Forging billets, P'gh.....	38.00	38.00	38.00	40.00
O.-h. billets, Phila.	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh....	42.00	42.00	40.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago.....	1.90	1.90	1.90	2.00
Steel bars, Pittsburgh....	1.80	1.80	1.80	1.90
Steel bars, Chicago.....	1.90	1.90	1.90	2.10
Steel bars, New York.....	2.14	2.14	2.14	2.24
Tank plates, Pittsburgh...	1.80	1.80	1.80	1.90
Tank plates, Chicago.....	1.90	1.90	1.90	2.10
Tank plates, New York...	2.12½	2.12½	2.12½	2.24
Beams, Pittsburgh	1.80	1.80	1.80	1.90
Beams, Chicago	1.90	1.90	1.90	2.10
Beams, New York.....	2.09½	2.09½	2.09½	2.24
Steel hoops, Pittsburgh...	2.20	2.20	2.20	2.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Jan.24, 1928	Jan.17, 1928	Dec.20, 1927	Jan.25, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.80	2.80	2.80	2.85
Sheets, black, No. 24, Chicago dist. mill.....	3.00	3.00	2.90	3.10
Sheets, galv., No. 24, P'gh	3.65	3.65	3.65	3.75
Sheets, galv., No. 24, Chicago dist. mill.....	3.85	3.85	3.70	3.95
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.20
Sheets, blue, 9 & 10, Chicago dist. mill.....	2.20	2.20	2.15	2.40
Wire nails, Pittsburgh....	2.55	2.55	2.50	2.60
Wire nails, Chicago dist. mill	2.55	2.55	2.55	2.65
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.45
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.50
Barbed wire, galv., P'gh..	3.25	3.25	3.20	3.30
Barbed wire, galv., Chicago dist. mill.....	3.25	3.25	3.25	3.35
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh,	$15.00	$15.00	$15.00	$16.75
Heavy melting steel, Phila.	13.50	13.50	13.50	15.00
Heavy melting steel, Ch'go	12.50	12.50	12.25	13.50
Carwheels, Chicago	14.00	14.00	13.50	15.50
Carwheels, Philadelphia ..	15.50	15.50	15.50	16.00
No. 1 cast, Pittsburgh....	14.50	14.50	14.50	16.00
No. 1 cast, Philadelphia..	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.00	16.50
No. 1 RR. wrot, Phila....	15.25	15.25	15.25	17.00
No. 1 RR. wrot, Ch'go (net)	11.00	11.00	10.50	12.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	$2.65	$2.75	$2.75	$3.25
Foundry coke, prompt....	3.75	3.75	3.75	4.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York..	14.25	14.25	14.25	13.37½
Electrolytic copper, refinery	13.87½	13.87½	13.75	13.00
Zinc, St. Louis.....	5.65	5.62½	5.67½	6.40
Zinc, New York.....	6.00	5.97½	6.02½	6.75
Lead, St. Louis.....	6.30	6.30	6.30	7.30
Lead, New York.....	6.50	6.50	6.50	7.50
Tin (Straits), New York.	55.37½	54.25	58.12½	65.25
Antimony (Asiatic), N. Y.	11.00	11.00	11.25	14.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Market Makes a Better Showing—Advance of $1 on Plates, Shapes and Bars

PITTSBURGH, Jan. 24.—The steel market is making a showing in keeping with the developments in main consuming lines that were expected to contribute to a good year. Predictions of good business were founded largely on expected expansion in railroad rolling stock purchases, the recovery by the motor car industry of the ground it lost in 1927, improvement in the oil industry, a fairly well sustained amount of building and construction, and the stimulating effect of a prosperous agricultural year. Improvement yet is to show in the oil industry, and building and construction work has not reached large proportions, but there is reflection of the increased buying power of the farmers. The automobile industry, although not yet in the stride of production of which it is capable, has registered a substantial rally from the low point of late last year and there is fairly full reflection of expectations as to railroad car buying.

It is early for complete rounding out of anticipated business, but despite that fact the steel industry has moved up to an ingot production averaging approximately 75 per cent of capacity, and the trade naturally looks confidently ahead to further expansion as the consuming industries not now active reach a better stride.

Events of the week have been chiefly in connection with prices. The Carnegie Steel Co. advanced prices of bars, plates and shapes $1 a ton to 1.85c., base, Pittsburgh, as of Jan. 19, and in this move, which made the new base effective only for the remainder of this quarter, there was prompt following by independent companies. Definitely stronger price ideas are entertained by strip steel makers, but these are with reference to second quarter business, since with few exceptions manufacturers are committed fully against probable production for this quarter. Following the advance in hot rolled bars, it is probable that makers of cold-finished bars will soon seek higher prices. Sheet makers are hampered in getting advances in this quarter by the fact that they are heavily obligated against what they will produce.

A striking argument for the need of better steel prices comes in the report of the Jones & Laughlin Steel Corporation for the final quarter of last year, when that company, despite its size and the fact that it is entirely self-contained, failed to earn its dividend requirements for the period by more than $300,000. It was the first time since the company began reporting earnings four years ago that it has not shown a surplus in every quarter.

Good specifications are reported for sheets, strips, cold finished steel bars and tin plate, and the new demand for wire products, apart from nails, is reported to be better than it has been, but the effect of heavy specifications last month in bars, plates, shapes and wire nails is reflected now in rather moderate shipping releases. With February requirements just ahead, plus the advance in the prices of the heavy tonnage products, the remaining days of the month should be marked by an increase in specifications. Some mills are yet to complete shipments against fourth quarter tonnages of bars, plates and shapes, but it is commonly said that low-priced orders in these products as well as in cold finished steel bars will be well completed by the end of the month.

Pig Iron.—The only business of consequence lately before the market was an inquiry from the Pressed Steel Car Co. for 1000 tons of car wheel iron running low in silicon and high in manganese. This business is reported to have gone to steel companies, but there is no information as to the price. Iron for that purpose usually is off-grade basic and the price is determined by the price of standard basic. Otherwise business has been almost entirely of lots of one or two carloads, with some melters who ordinarily buy ahead now depending on spot offerings. Prices are unchanged. The Carnegie Steel Co. is reported to be making ready to start a furnace at its Farrell, Pa., works.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	17.50
Gray forge	16.75
No. 2 foundry	17.25
No. 3 foundry	16.75
Malleable	$17.25 to 17.50
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Consumers of the commonly used ferroalloys are specifying against contracts very steadily and some users of spiegeleisen are exceeding their monthly quotas. Producers are holding firmly to $100, seaboard, for ferromanganese.

Fluorspar.—A good-sized lot of domestic gravel spar, recently placed by an eastern Ohio steel company, went at $14.50 per net ton, at mines, and apparently that is the ruling price on tonnages of more than a carload. Although most steel companies are usually willing to pay a premium for domestic fluorspar, they now are able to get it at practically the same delivered price as the foreign material. Foreign spar at $16, Atlantic seaboard, is $19.66, delivered Pittsburgh district, while domestic spar at $14.50 at mines is $19.75, delivered in this district.

Semi-Finished Steel.—Users of wire rods who elected to depend upon the spot market and did not avail themselves of a chance to cover for this quarter prior to the advance to $42, base Pittsburgh or Cleveland, have found it necessary to pay the higher price. Several fair-sized tonnages have been sold at $42, base, in the past week. Pittsburgh and Youngstown steel companies are quoting large billets and slabs at $33 and sheet bars and small billets and slabs at $34. The open market in these forms of steel is no broader than it has been for some time because of the fact that so many non-integrated manufacturers are tied up to regular sources of supply and the business no longer is competitive. Pipe skelp also moves largely on private arrangements between producers and consumers.

Bars, Plates and Shapes.—The advance in these products of $1 a ton to 1.85c., base Pittsburgh, announced by the Carnegie Steel Co. last Thursday, has been followed by the independent producers in this district and in all cases it became effective upon announcement and was for business placed for shipment during the remainder of this quarter. All manufacturers still have some tonnage priced at 1.75c., base, to work off, and have not advanced very far into 1.80c. business. Specifications lately have been a little slow, as is quite natural in view of heavy December specifications for January shipment, but last week's advance is counted on to stimulate shipping instructions, which usually expand in the last week of each month. The mills are said to have an objective of 2c., base, on second quarter contracts. Reinforcing bars now are priced at 1.95c., base, to other than recognized mill distributers, but the market still is quotable at a range of 1.90c. to 1.95c., since there has been business within the week at the lower figure.

Rails and Track Supplies.—Little new tonnage in standard-section rails remains to be bought by roads which normally place part or all of their requirements in Pittsburgh, but the local producing unit has a good order book and is running practically full. Light-section rails are slow and sales usually are of single carloads. Track accessories seem to wait on the opening of the track-laying season for specification. Spikes still are quoted at $2.80, base, per 100 lb., but it is understood that a preferential of $2 a ton has been and still is being extended to the steam railroads, as distinct from sales to jobbers. Railroads also are able to buy track bolts at less money than jobbers.

Wire Products.—New business in nails is of moderate proportions, with jobbers still getting shipments on December orders and specifications, but there has been considerable quickening in the demand for other wire products, notably plain wire, while the increasing production of automobiles is bringing a better demand for spring wire. Wire prices, recently weak in the Middle West, are reported to have strengthened and against recent sales at $2.35, base, per 100 lb., Chicago, it is now said that $2.45 is the ruling price.

Tubular Goods.—It is a little early for much demand for pipe in connection with building and construction work and oil country pipe waits on some definite improvement in the oil industry. Several pipe line projects are mentioned, but they are not moving very rapidly toward mill order books. Locomotive boiler tubes are doing a little better and mechanical tubing is selling fairly well as the motor car industry shapes plans for increased production. There is nothing new as to prices.

Sheets.—Specifications against late 1927 orders are coming in freely, but shipments on these specifications are supplying almost all of the current requirements and new business does not amount to much. It still is difficult for the mills to get the prices they announced on first quarter business, not only because wants not covered by contract are so few and small, but because there are few makers who will refuse to extend original orders to apply to new requirements that develop. Mill operations have receded slightly in the past week, partly because of the fact that production the fore part of the month was a little too heavy for the specifications. Some fair-sized orders are coming from automobile body builders, but demand from that source still has room to expand, since production of motor cars has not mounted nearly as rapidly as might be imagined from the optimistic utterances as to car sales. What is wanted, however, is wanted in a hurry, indicating light stocks in consumers' hands.

The Iron Age Composite Prices

Finished Steel

Jan. 24, 1928, 2.314c. a Lb.

One week ago	2.314c.
One month ago	2.314c.
One year ago	2.396c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Jan. 24, 1928, $17.67 a Gross Ton

One week ago	$17.67
One month ago	17.54
One year ago	19.30
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c. to 1.85c.
F.o.b. Chicago	1.90c. to 2.05c.
Del'd Philadelphia	2.12c. to 2.17c.
Del'd New York	2.14c. to 2.19c.
Del'd Cleveland	1.99c. to 2.04c.
F.o.b. Cleveland	1.80c. to 1.85c.
F.o.b. Buffalo	1.90c. to 1.95c.
F.o.b. Birmingham	2.00c. to 2.10c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c. to 1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.65c. to 1.70c.
F.o.b. Chicago Heights mill	1.80c.

Iron

Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c. to 1.85c.
F.o.b. Chicago	1.90c. to 2.05c.
F.o.b. Birmingham	2.00c. to 2.10c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia	2.05c. to 2.10c.
F.o.b. Coatesville	1.95c. to 2.00c.
F.o.b. Sparrows Point	1.95c. to 2.00c.
F.o.b. Buffalo	1.90c. to 1.95c.
Del'd New York	2.12½c. to 2.17½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c. to 1.85c.
F.o.b. Chicago	1.90c. to 2.05c.
F.o.b. Birmingham	2.00c. to 2.10c.
F.o.b. Buffalo	1.90c. to 1.95c.
F.o.b. Bethlehem	1.95c. to 2.00c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia	2.08c. to 2.13c.
Del'd New York	2.09½c. to 2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, 2 in. and narrower, P'gh	2.10c. to 2.20c.
All gages, wider than 2 in., to 6 in., P'gh	2.00c. to 2.10c.
*All gages, 6 in. and wider, P'gh	1.80c. to 1.90c.
All gages, narrower than 6 in., Chicago	2.30c. to 2.40c.
All gages, 6 in. and wider, Chicago	2.10c. to 2.20c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.20c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.25c. to 3.40c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	$3.20 to 3.25
Barbed wire, painted	2.95 to 3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence
Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10c. to 2.20c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.20c. to 2.30c.
Nos. 9 and 10, del'd Cleveland	2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c. to 2.52c.
Nos. 9 and 10, f.o.b. Birmingham	2.25c. to 2.30c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.80c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill	3.00c.
No. 24, del'd Cleveland	3.09c.
No. 24, del'd Philadelphia	3.12c. to 3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.75c. to 3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.75c.
No. 24, f.o.b. Chicago dist mill	3.85c.
No. 24, del'd Cleveland	3.84c. to 3.94c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	3.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C. $11.20	25-lb. coating I.C. $16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.00 to 4.10
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.00 to 3.10
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.00 to 3.10
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.00 to 4.15
6100	(Chrom. Vanad. spring steel)	3.50 to 3.75
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.05 to 4.20
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.05 to 3.10
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	$2.75 to 2.80
Spikes, boat and barge	3.10
Tie plates, steel	2.25
Angle, bars	2.75
Track bolts, to steam railroads	3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5 and 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

Tin Plate.—Mill operations are sustained at about 75 per cent of capacity. Specifications are largely in for March quotas and it will be another fortnight before they begin to come along for April shipment. Some light on the prospects is likely to develop at the canners' convention, which is being held this week in Chicago.

Cold-Finished Steel Bars and Shafting.—There has been little or no recession in the specifications from the high rate attained last month. Producers are well satisfied with the price situation. It seems that in getting contracts for this quarter at 2.20c., base Pittsburgh, much resistance was encountered in the Detroit district, as that price represented an advance of $2 a ton, while other steel products were either unchanged or lower. But there was no weakening in the price. It is now likely that another advance will be made to cover the recent advance in hot-rolled bars, and as makers believe they are entitled to a greater spread between the hot and cold bar price, the advance probably will be $2 a ton, against $1 a ton in hot-rolled bars.

Bolts, Nuts and Rivets.—Improved railroad demand gives the market for bolts and nuts an activity it has recently lacked. Rivets still are rather dull, but prices of all three lines are firm.

Hot-Rolled Flats.—The objective of producers is 2.10c., base, Pittsburgh, for material narrower than 6 in. and 1.90c., base, for widths 6 in. to 12 in., but there continues to be acceptance of orders for delivery in this quarter at concessions of $1 to $2 per ton from those prices. Specifications against orders placed late last year continue to run well ahead of those of last month, but there is rather general dissatisfaction among mills over the price returns.

Cold-Rolled Strips.—Announcement by one large producer of an advance of $3 per ton to 2.90c. for lots of three tons or more and to 3.15c. for lots of one to less than three tons, has not yet been generally followed by other makers. The new prices are regarded as applying on second quarter business. Orders for this quarter still are being taken at 2.75c. and 3c.

Coal and Coke.—Beehive oven coke producers still are finding it difficult to market their outputs, which, though small by ordinary comparisons, are large in view of the fact that offerings of by-products ovens are liberal. Single carloads of beehive oven furnace coke are salable at $2.75, but on larger lots the prevailing price is $2.65. Spot beehive oven foundry coke is readily obtainable at $3.75 to $4. There is a fairly firm market for slack coal, but in other grades the market is as dull and favors buyers as much as ever.

Old Material.—Blast furnace scrap is not easily sold except at a concession from recent prices and machine shop turnings have been sold as low as $10.50, this also marking a decline from prices of a week ago. In other grades, prices are substantially unchanged, except that sales of the railroad specialties no longer are easily made at more than $17. Consumer interest is low and dealers, not being pressed for deliveries on old sales, are not offering the market much support.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.00 to $15.25
Scrap rails	14.50 to 14.75
Compressed sheet steel	14.00 to 14.25
Bundled sheets, sides and ends	13.00 to 13.25
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	15.00 to 15.50
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	15.00 to 15.25
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.75 to 17.00
Railroad coil and leaf springs	16.75 to 17.00
Rolled steel wheels	16.75 to 17.00
Low phosphorus billet and bloom ends	18.50 to 19.00
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.00 to 11.50
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	10.00 to 10.25
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.50 to 15.00
Rails 3 ft. and under	15.00 to 15.25
Malleable Grades:	
Railroad	15.00 to 15.25
Industrial	14.50 to 14.75
Agricultural	14.00 to 14.25

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.39
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft annealed, base per 100 lb.	$3.00 to 3.10
Wire, galvanized soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Hearing in Pig Iron Dumping Case

Hearings were held before the Customs Court at Philadelphia, Jan. 10 and 11, on a charge of violation of the anti-dumping act brought against Hickman, Williams & Co., pig iron brokers, Philadelphia. The defendants imported more than 5000 tons of German pig iron last summer through the port of Norfolk, Va. The admission was made that the iron was bought at less than prevailing prices in Germany, but the argument was advanced that lower prices for wholesale lots are specifically permitted under the provisions of the Federal act.

Invoices of domestic sales by the German producer showed prices that were in no case more than seven marks higher than the price paid by the American importer. These sales, moreover, covered small lots, the largest calling for 400 tons.

Jones & Laughlin Report Deficit of $340,333 for Last Quarter

The Jones & Laughlin Steel Corporation, Pittsburgh, reports a deficit after the payment of dividends of $340,333 for the quarter ended Dec. 31, while its surplus for the year of $4,293,002 compares with $8,578,235 in 1926. Net income for the final quarter of last year was $1,397,123, or $340,333 less than the quarter's dividend requirements. Surplus at the end of last year amounted to $53,413,072, compared with $49,270,070 at the end of 1926.

Decline in Malleable Castings Production in 1927

WASHINGTON, Jan. 24.—Production of malleable castings by 134 identical plants in 1927 totaled 631,388 tons, while bookings aggregated 564,158 tons, against 715,384 tons and 607,949 tons respectively in 1926, according to the Department of Commerce. Shipments were 609,134 tons and 684,582 tons. The rated capacity in 1927 was 1,253,849 tons, so operation was at 50.4 per cent. Capacity in 1926 was 1,307,889 tons, and operation was at 54.7 per cent.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾ in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c. to 1.85c.
Sheared	1.80c. to 1.85c.
Universal	1.80c. to 1.85c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $43. Cleveland mill base, $42.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.25 to $10.75

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.65 to $2.75
Foundry, f.o.b. Connellsville prompt	$3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	11.50
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.15 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.30

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$14.50 to $15.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	——
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discount of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Western Mills Advance $1 on Heavy Steel Products—13,000 Tons for Cars

CHICAGO, Jan. 24.—Announcement was made last Thursday by the Illinois Steel Co. that, effective at once, prices for plates, shapes and bars were advanced $1 a ton on all new business for delivery before April 1, and that second quarter prices would be made public later. Independent mills have followed suit. This move has tended to accelerate specifying, though temporarily at least it is acting as a checkmate to buying. A test of the new prices is lacking.

The St. Louis-San Francisco's car order is being delayed while alternative bids are being taken on hopper cars of smaller capacity. Specifications from car builders call for the immediate delivery of 5000 tons of sheets, 4000 tons of plates, 2500 tons of shapes and 1500 tons of bars.

In heavy steel products total specifications against first quarter contracts equal those of a week ago. Accumulation of plates, shapes and bars by buyers through speculation prior to Dec. 31 at fourth quarter contract prices was not heavy and has had little effect on this market in the opening weeks of the year. In sheets the situation is different and it has taken the first three weeks of 1928 to write off the bulk of tonnage carried into the new year on old contracts.

A $10,000,000 bond issue has been underwritten on Chicago's new opera house, and brokers are expecting a $10,000,000 preferred stock issue this week.

Pig Iron.—Orders for second quarter iron, presumably for water shipment after the opening of navigation, are being solicited in this market at a shade under $18, base, delivered. It is rather commonly believed that sellers are accumulating orders against boat shipments which may assume large proportions in the second and third quarters. With the closing down of the second Mayville furnace, Milwaukee users of iron are again paying the freight rate from Chicago, which is $1 a ton, or 27c. above the rate that prevailed from Mayville. Local furnaces report active sales, the bulk being for second quarter delivery. Both orders and shipments are the highest so far this year. A price of $18 was named on about 20 cars of mill iron produced when a new stack was blown in. Local merchant furnaces are holding rigidly to $13.50 a ton.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	20.18
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—On the whole this market is quiet. It is reported in some quarters that an advance in ferromanganese is not unlikely.

Prices delivered Chicago: 80 per cent ferromanganese, $107.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $38.76 to $39.76.

Plates.—This market is unusually active and mills which are fortified with well balanced order books are not now promising deliveries in less than three to four weeks, an extension of 10 days since a week ago. Car builders have entered specifications for 4000 tons and an order for 5000 tons of wide plates for use in oil tank construction is for delivery at the earliest convenience of the producers. Miscellaneous users are feeling the pinch of short range specifications and in some cases are now getting additional requirements piecemeal as mills find it desirable to apportion weekly rollings. Definite inquiry has developed for 2500 tons of plates for tank construction in Texas and several new projects are developing in that territory. Another factor contributing to the strength of the plate market is the increased activity of fabricators. Local producers have all fallen in line with the new prices and quotations now are 1.95c., Chicago, for 100 tons or more and 2.05c. for smaller lots. These apply only on current business for delivery in the first quarter. In view of contracts already closed mills will benefit by this increase only on spot business over the next two months.

Mill prices on plates per lb.: 1.90c. to 2.05c., base, Chicago.

Structural Material.—Fabricating plants tributary to Chicago mills have received contracts calling for 12,000 tons of steel. The largest award was the Forman Bank Building, Chicago, taking between 8000 and 8500 tons. A shop in Minneapolis will ship 2500 tons for erection at Fresno, Cal. Among active projects are the Steuben Club, 4500 tons, and an office building, 2400 tons, both in Chicago, and a bridge across the Illinois River at Pekin, Ill., 1700 tons. Recent bids by fabricators clearly indicate a stiffening in prices brought about not alone by changes in mill quotations but also by the determination of fabricators to widen margins of profit. Awards in the past three weeks have added heavily to shop books. Car builders have ordered out 2500 tons of structural shapes. Chicago mills have announced that effective at once spot prices on structural shapes for delivery during the remainder of this quarter are 1.95c. to 2.05c., Chicago, depending on the tonnage desired. The bulk of shipments in this quarter, however, will be at the old schedule, which was $1 a ton lower.

Mill prices on plain material per lb.: 1.90c. to 2.05c., base, Chicago.

Reinforcing Bars.—The Calumet Steel Co. was awarded 3000 tons of rail steel reinforcing bars for the Campbell Soup Co.'s plant in Chicago. Contractors on State and county road work in Illinois are preparing for spring work and the trade expects 3000 tons of bars to be placed in the next few days. The bulk of this tonnage will go to hard steel bar producers who are asking 1.85c. for bars that are to go into slabs and 1.90c. for bars to be used in bridges and culverts. Billet steel reinforcing bar awards are few, but active projects are numerous, and the outlook is favorable. The announcement of higher prices at mills is spurring dealers to put up warehouse prices. New business and fresh inquiry are shown on page 304.

Bolts, Nuts and Rivets.—Specifications are heavier following increased demand from the railroads, automobile manufacturers and car builders. Prices are steady.

Rails and Track Supplies.—Rail output is steady at 82 per cent of capacity. Buying is light but fresh inquiry, including 35,000 to 40,000 tons required by the Rock Island, is active. Specifications for track accessories are large and tie plate production is now close to capacity. The light rail market is dull.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per Lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Wire Products.—Demand for wire products is broadening and mill output has been advanced to 65 per cent of capacity. The bulk of business from the jobbing trade comes from the South and Middle West, the Northwest being winter-bound. A more extensive use of wire is noted in the manufacturing trade. The price situation is less well defined than a week ago. St. Louis remains the battle ground for producers in the South and in the Middle States. Shading in wire prices has developed in Iowa, though the volume of business transacted is not large. In the local market prices for both wire and nails are holding moderately well though buyers of nails in some instances are now exercising protective agreements made in December at prices that range from $2.45 to $2.50, Chicago.

Bars.—There is little of note in this market except in the announcement by Chicago producers that spot sales of soft steel bars during the remainder of this quarter are to be $1 above quotations on which present contracts are based. As a general thing users are well covered and therefore the tonnage that will be shipped against the new prices will be small as compared to total deliveries over the three months period. The new

quotations are 1.95c., Chicago, to 2.05c., depending on the tonnage. Specifications, including 1500 tons from car builders, are steady but sales are measurably smaller. The automobile trade has assumed leadership over agricultural machinery manufacturers in bar shipments. No change is noted in the ability of mills to make deliveries. Producers of iron bars have not followed the lead of soft steel bar mills in advancing prices, but this move is under consideration and may take place before the end of the week. Production of alloy steel bars has been advanced to 85 per cent of mill capacity. Sales in rail steel bars are dragging, but specifications are heavier and now equal production. Mill output has not been increased, although stocks are not considered large for this time of the year. Fence post order books have expanded rapidly in the last week. Prices are steady at 1.80c., Chicago Heights mills.

Mill prices per lb.: Soft steel bars, 1.90c. to 2.05c., base, Chicago; common bar iron, 1.90c., base, Chicago; rail steel bars, 1.80c., base, Chicago Heights mill.

Sheets.—Current buying is small and specifications do not bulk larger than a week ago. Hot mills are operating at only 65 per cent of capacity. Prices are steady and deliveries are prompt.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.05c.; No. 24 galvanized, 3.90c.; No. 10 blue annealed, 2.25c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Cold Rolled Bars.—Prices are firm at 2.20c., Chicago. Shipments are gradually growing larger but current buying is of small proportions. Deliveries have extended and now range from seven to 10 days on orders that have to be made up. Producers have well-assorted stocks on hand and are drawing against them in preference to expanding production.

Cold Rolled Strip.—Local producers announce that effective Jan. 25 cold rolled strip in widths up to 12 in. and in lots of one to less than three tons will be quoted at 3.15c., base f.o.b. Cleveland, or 3.45c., delivered Chicago. A deduction of 25c. per 100 lb. will be allowed on items of three tons or more. Users are being notified of this change, thus affording them opportunity to cover at the old schedule. Buying is brisk and specifications are the heaviest in many months. Deliveries are extended to four or five weeks.

Cast Iron Pipe.—This commodity is only moderately active at prices that show no improvement. Inquiry for small tonnages is a trifle more brisk but projects are slow in developing into orders. The McWane Cast Iron Pipe Co. is reported to have taken 2000 tons for Yellow Springs, Ohio. Portsmouth, Ohio, is holding bids open on 600 tons. Minneapolis is taking figures on 3500 ft. of 4-in. to 24-in. pipe That city usually buys centrifugal pipe but on this occasion bids are also asked on the sand cast product.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $34.20 to $36.20; 4-in., $38.20 to $40.20; Class A and gas pipe, $4 extra.

Hot Rolled Strip.—Prices are weak and common quotations on all gages wider than 6 in. are 2.10c. to 2.20c. and on narrow widths 2.30c. to 2.40c.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb.	$3.20
Common wire nails, base per keg	$2.90 to 3.00
Cement coated nails, base per keg	2.90 to 3.00

Coke.—The Chicago market is active and by-product foundry coke is quoted $9, f.o.b. local ovens, and at $9.50, delivered in the switching district.

Old Material.—Although a fair amount of inquiry is before the trade, it develops slowly. Interest in this market centers in the efforts of dealers to cover orders recently booked. Trading in heavy melting steel is at $12.50 to $12.75. Prices as a general rule lean toward the weak side, primarily because of lack of buying interest. Speculation is in evidence as brokers continue to bid up railroad lists. An oversupply of cast iron borings is causing prices to sag. Malleable users are buying little following purchases made under the condition that shipments would be made promptly. Although the immediate demand for short rails is smaller there still exists a shortage. Included in railroad lists are 9000 tons offered by the St. Paul, 4000 tons by the Burlington and a blank list by the Michigan Central.

Prices delivered consumers' yards, Chicago:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	14.25 to 14.75
Hydraulic compressed sheets	10.75 to 11.25
Drop forge flashings	9.75 to 10.25
Forged, cast and rolled steel carwheels	15.50 to 16.00
Railroad tires, charging box size	16.25 to 16.75
Railroad leaf springs, cut apart	16.25 to 16.75
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.50 to 15.00
Coil springs	16.50 to 17.00
Electric Furnace Grades:	
Axle turnings	13.00 to 13.50
Low phosphorus punchings	14.25 to 14.75
Low phosphorus plate, 12 in. and under	13.50 to 14.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings	10.25 to 10.75
Short shoveling turnings	10.25 to 10.75
Machine shop turnings	7.50 to 8.00
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	15.00 to 15.50
Cupola Grades:	
Steel rails less than 3 ft	15.25 to 15.75
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Railroad	13.75 to 14.25
Agricultural	12.50 to 13.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	18.75 to 19.25
Iron car axles	21.50 to 22.00
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.25 to 9.75
No. 2 busheling	4.25 to 4.75
Locomotive tires, smooth	12.50 to 13.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.50 to 14.00
No. 1 agricultural cast	13.50 to 14.00
Stove plate	12.00 to 12.50
Grate bars	11.50 to 12.00
Brake shoes	11.75 to 12.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Youngstown-Inland Merger on Eve of Consummation

YOUNGSTOWN, Jan. 24.—Since Monday morning L. E. Block, P. D. Block and other officials of the Inland Steel Co., Chicago, have been in conference with President James A. Campbell and officers of the Youngstown Sheet & Tube Co. relative to a merger of the two concerns. Here it is believed that the merger is virtually assured, only details remaining to be worked out. Mr. Campbell, it is expected, will head the consolidation. It was announced tonight that a statement would be issued Wednesday.

New York

Bethlehem Advances Heavy Steel Products $1—Pig Iron More Active

NEW YORK, Jan. 24.—The pig iron market continues to show gradual improvement. Shipping orders are heavier and the volume of inquiry is growing. One large melter is in the market for 2500 to 3000 tons of foundry iron for delivery during the four months beginning March 1. Other inquiries, made up largely of relatively small individual lots, total 4000 tons. Sales by local brokers during the week were in good volume, totaling 7500 tons compared with 10,000 tons in the previous week. The New York Air Brake Co. closed for 1000 tons of malleable for second quarter delivery at Watertown, N. Y. Another melter closed for 1000 tons of foundry for next quarter. The New York Central Railroad bought about 300 tons against its inquiry for Frankfort, N. Y., and Elkhart, Ind., and the Delaware, Lackwanna & Western Railroad placed 100 tons for its Scranton, Pa., shops. The Worthington Pump & Machinery Corporation purchased 90 tons of Bessemer for its Harrison, N. J., plant. Efforts of sellers to obtain a minimum of $19.50, base furnace, on eastern Pennsylvania foundry iron, and of $16, base furnace, on Buffalo foundry are increasingly successful.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$21.41 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 21.52
East. Pa. No. 2 fdy., sil. 2.25 to 2.75	20.89 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—With consumers well covered for their immediate needs of ferromanganese, sales are confined to carload and small lots in which there has been a fair business done. The same is true of spiegeleisen and the prices for both alloys are unchanged at $100 for ferromanganese and at $31 to $32 for spiegeleisen. Specifications on contract for these and other ferroalloys are reported to be improving.

Finished Steel.—The Bethlehem Steel Co. on Monday announced an advance of $1 a ton on plates, shapes and bars at its mill basing points in the East and at Johnstown, Pa., for shipment during the remainder of first quarter. This follows the advance of the same amount by mills in the Pittsburgh, Youngstown and Chicago districts. Other Eastern mills are expected to follow Bethlehem's action. New mill prices are: 1.95c., Buffalo, on plates, shapes and bars; 2c., Bethlehem, on structural shapes; 2c., Coatesville and Sparrows Point, on plates, and 1.85c., Pittsburgh, for shipment from Johnstown. Delivered prices at New York on the new basis are 2.14½c. per lb. for shapes and 2.17½c. for plates, but these prices will not affect much of the tonnage to be shipped this quarter because of the heavy contracting done at former prices. Consumers and jobbers in the New York district are taking shipments in good volume against specifications filed with the mills a few weeks ago, but these shipments are providing for most of the current needs and new requirements are not in large volume. The leading Eastern producer of plates and shapes reports substantial improvement this month in the volume of business on its books, and points to a fair accumulation of active structural steel projects under negotiation. The amount of new tonnage coming out for bids in the past week was very light. The largest structural award was 7000 tons for a New York subway section to be fabricated by the McClintic-Marshall Co.

Mill prices per lb., delivered New York: Soft steel bars, 2.14c.; plates, 2.12½c.; structural shapes, 2.09½c.; bar iron, 2.14c.

Reinforcing Bars.—The market is seasonably quiet and there are few pending jobs involving good-sized tonnage. On the run of mill business prices are being well maintained on a basis of 1.90c. per lb., Pittsburgh. Distributers are quoting 2.20c., Youngstown warehouse, or 2.57½c., on cars at New York. Out of New York warehouse, the price is 2.80c. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Warehouse Business.—Demand is irregular, some jobbers reporting a moderate volume of purchasing, while others find but little activity. Prices show no change.

Coke.—Most consumers are fairly well covered on contract and there is but little inquiry for prompt shipment coke. Standard foundry is still quoted at about $4 per ton, Connellsville, and standard furnace at $2.75 to $3 per ton, Connellsville. Delivered prices on Connellsville foundry coke are: To northern New Jersey, $8.03; to New York or Brooklyn, $8.79; to Newark or Jersey City, $7.91. By-product foundry coke is quiet and unchanged at $9 to $9.40 per net ton, delivered Newark or Jersey City.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.30c.
Flats and squares	3.80c.
Cold-rolled strip, soft and quarter hard,	6.00c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage),	3.84c. to 3.89c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.10	$5.85
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.90c. to 4.00c.
No. 22	4.05c. to 4.15c.
No. 24	4.10c. to 4.20c.
No. 26	4.20c. to 4.30c.
No. 28*	4.35c. to 4.45c.
No. 30	4.60c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.50c. to 4.60c.
No. 20	4.65c. to 4.75c.
No. 22	4.70c. to 4.80c.
No. 24	4.85c. to 4.95c.
No. 26	5.10c. to 5.20c.
No. 28*	5.35c. to 5.45c.
No. 30	5.75c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Cast Iron Pipe.—Although recent quotations of Northern makers have figured back to less than $28 per net ton, Birmingham, the actual freight rate involved was small and the Northern foundry price was close to $30 per ton, base. The City of New York has awarded 2200 tons of pipe to the National Cast Iron Pipe Co. and the Donaldson Iron Co., the low bidders. The New Haven Water Co., New Haven, Conn., is inquiring for about 2000 tons of 6, 8, 16, 36 and 42-in. water pipe. Stone & Webster, Inc., Boston, and the Adirondack Light & Power Co., Amsterdam, N. Y., are in the market for about 1000 tons of pipe each.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $37.25 to $38.25; 4-in. and 5-in., $42.25 to $43.25; 3-in., $52.25 to $53.25; Class A and gas pipe, $4 to $5 extra.

Old Material.—Prices of all grades show little change. Brokers shipping mixed borings and turnings to Swedeland, Pa., have advanced buying prices to $10.50 per ton, delivered, and machine shop turnings are being purchased at $10.50 to $11 per ton, delivered Phoenixville and Harrisburg, Pa. A dealer who was paying $13 per ton for specification pipe delivered to a Lebanon, Pa., consumer has reduced the offering price from 25c. to 40c. per ton. No. 1 heavy melting steel and yard grade of heavy melting steel are unchanged. Thus far the scrap market has failed to reflect the improvement in business reported by the steel mills.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.75 to 7.25
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	8.75 to 9.00
Locomotive grate bars	8.25 to 8.50
Machine shop turnings	6.75 to 7.50
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.25
Mixed borings and turnings	7.00 to 7.50
Steel car axles	16.50 to 17.00
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.75 to 9.00
Forge fire	6.50 to 7.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.50 to 11.00
Cast iron carwheels	11.25 to 11.75
Stove plate (foundry)	8.75 to 9.00
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.00 to 11.50

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.50 to $14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.50 to 12.00
No. 2 cast (radiators, cast boilers, etc.)	11.00 to 11.50

Cleveland

Structural Steel Award of 57,800 Tons for Cleveland Terminal Project

CLEVELAND, Jan. 24.—An order for 57,800 tons of structural steel was placed today by the Cleveland Union Terminals Co. with the American Bridge Co. for construction work in connection with the Cleveland Union Depot project. This included the station proper and other work in addition to buildings covered by an inquiry for 20,000 tons reported last week. Deliveries are to start May 1.

Independent mills generally have followed the Carnegie Steel Co. in advancing steel bars, plates and structural material to 1.85c., Pittsburgh, for delivery throughout the first quarter, and the indications are that these prices will be adhered to except for steel on which quotations or contracts were made before the advance. Local bar mills have made a similar advance to 1.85c., Cleveland. One Ohio plate mill has not yet made the advance. A large proportion of consumers are under contract for the quarter at 1.80c. Some of the mills will about complete shipments this month against specifications placed in December at 1.75c.

Some of the mills report a gain in specifications this month over December, although expiring contracts brought out a heavy tonnage during the latter month. Mills continue to get a good volume of specifications from the automotive industry in Michigan. Locally the demand for sheets and strip steel from stamping plants and other parts makers is not as heavy as earlier in the month, when consumers gave heavy specifications for early needs. Plates in small lots are moving better than for several months, business having improved with boiler and tank shops. The Sinclair Refining Co. has placed 42 stills with three shops. These will require 1700 tons of plates. Inquiry in the structural field has become more active.

Pig Iron.—Buying fell off somewhat the past week, but sales by Cleveland interests totaled about 19,000 tons. Activity subsided in the Michigan territory, where buying has recently been heavy, but showed a gain in the Buffalo territory. A few foundries are now showing interest in second quarter contracts. While some consumers have covered for the entire first half, the aggregate tonnage placed for delivery beyond March was small. However, many foundries evidently have covered in their first quarter contracts for enough iron to carry them well into the second quarter. A Muncie, Ind., foundry is inquiring for 3000 tons of malleable iron for the second quarter and a Fort Wayne consumer wants 500 tons of foundry iron. Other inquiries are light. There is virtually no change in the price situation, although the market is firmer in Michigan, where there is still a range of $17.50 to $18. Quotations on foundry and malleable iron by Lake furnaces range from $16.50 to $17, but producers are not going to the lower figure except for shipment to points where they are at a freight disadvantage. Regular silicon differentials are not being adhered to. Foundry operations show some gain in the northern Ohio territory and this has resulted in better shipping orders. Shipments to Michigan automobile foundries continue heavy.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Sheets.—Specifications continue good from the automotive industry and fair from other consumers. Although most buyers are under contract at the old prices, quite a little new business is being taken, mostly in black sheets with special finishes. The market shows a firmer tone except on galvanized sheets, 2.90c., Pittsburgh, for black and 2.10c. for blue annealed now being generally adhered to. Galvanized sheets are still available at 3.65c., Pittsburgh.

Strip Steel—The demand for hot-rolled strip steel is heavy from the automotive industry but there is not much new business as most consumers are under contract. Prices are firm at 1.85c. for material 6 in. to 12 in. wide and at 2.05c. for narrower than 6 in. Several of the independent mills have not yet joined in advancing cold-rolled strip to 3.15c., base, but are still quoting 3c. as a Cleveland base price and 2.75c. for three tons and over.

Fluorspar.—The gravel fluorspar market has been fairly active the past week and most consumers are now covered for the first half. Sales included 2000 tons to a Cleveland mill and two other lots, one for 3000 tons and the other for 500 tons, all at $14.50, mines. Makers are still asking $15 for car lots.

Warehouse Business.—The demand shows a fair gain in practically all lines. The advance in mill prices on steel bars, plates and structural material has not resulted in any change in warehouse prices. Galvanized sheets continue to move in very good volume.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Reinforcing Bars.—Considerable work is still pending and one 300-ton inquiry developed during the week. Rail steel bars are still quoted at 1.65c., mill, makers not having followed the advance made on billet steel bars.

Old Material.—The market has a weak tone, but prices have not declined. There is no new demand from consumers. Scrap is coming out more plentifully at prevailing prices, but dealers are not buying much material to fill old orders. Dealers are now paying $15 for heavy melting steel for Youngstown delivery, a reduction of 25c. a ton from a week ago, but they are unable to buy blast furnace scrap below $10.50. Offerings of scrap by the automotive industry in Michigan for February are heavy, reflecting the increase in plant operations. Lists out for closing this week aggregate over 16,000 tons. These include the Buick Motor Car Co., 6000 tons; Dodge Brothers, Inc., 4000 tons; Chrysler Corporation, 2400 tons, and the Chevrolet Motor Car Co., 3700 tons.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.75 to $14.00
No. 2 heavy melting steel	13.25 to 13.50
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	11.50 to 12.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.50 to 10.75
Mixed borings and short turnings	10.50 to 10.75
No. 2 busheling	10.50 to 10.75
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Iron Ore.—Lake Superior ore consumed during December amounted to 3,992,099 tons, a gain of 178,462 tons over the previous month. Consumption in December, 1926, was 4,562,020 tons. Furnace stocks Jan. 1 amounted to 30,977,605 tons. On Jan. 1 there were 37,581,944 tons of ore on hand at furnaces and Lake Erie docks as compared with 38,425,751 tons on the same date a year ago. Central district furnaces during December consumed 1,906,341 tons, a gain of 65,177 tons over the previous month. Lake front and Canadian furnaces used 1,882,547 tons, an increase of 120,561 tons, and all rail furnaces consumed 138,791 tons, an increase of 4608 tons. Eastern furnaces consumed 64,420 tons, or a decrease of 11,884 tons as compared with November. On Dec. 31 there were 144 furnaces in blast using Lake ore, a gain of two for the month.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, 5/16-in.	2.80c. to 3.00c.
Structural shapes	2.50c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c. to 2.60c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.25c. to 5.25c.
Cold-finished steel, squares and flats	3.75c. to 5.75c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.25c.
Galvanized sheets (No. 24)	5.10c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
5/16-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

Bolts, Nuts and Rivets.—The demand for bolts and nuts from practically all sources shows considerable gain this month over December, and makers say that their January business will be the best of any month since last June. The demand for rivets also shows some improvement. Practically all orders are in the form of specifications against contracts placed at regular prices.

Semi-Finished Steel.—Specifications for sheet bars show a gain and the leading local producer has started up two additional open-hearth furnaces, now operating 10 of 14. The ruling quotation is $33, Cleveland, or $1 a ton below the last quarter price. Billets and slabs are unchanged at $33.

Coke.—The demand for by-product coke for domestic use is very dull and one Valley producer has shut down some of its ovens. The market is not firm, with $4.50 the nominal quotation for egg size. Connellsville foundry coke is moving slowly with prices unchanged at $3.75 to $5.10, ovens.

Philadelphia

All Mills Not Yet On New Price Basis—Pig Iron Quiet

PHILADELPHIA, Jan. 24.—A few eastern Pennsylvania producers of plates and shapes have not yet followed the recent advance of $1 a ton by the leading interest, but general adherence to the new level is expected in a few days. Consumers not already fully covered at the former basis of 1.80c. per lb., Pittsburgh, have been protected with first quarter contracts, so that no real test of the new level of prices is expected until second quarter contracts are considered.

Sheets still exhibit a tendency to weakness, although local consumers in the field of automobile body building and radio manufacture have been making some small purchases in addition to their contracts. With most consumers of pig iron well covered for the first quarter, current business is mostly in carload lots. The scrap market continues quiet, but with steel mills beginning to make small increases in operations, dealers foresee more firmness in prices.

At the opening of bids by the Pennsylvania Railroad, Jan. 20, on 25,000 tons of plates, 8000 tons of bars and 2000 tons of shapes, quotations were on the basis of 1.80c. per lb., Pittsburgh. For delivery in the Chicago district, the leading interest quoted 1.95c. per lb., Chicago, the new price effective the day of the opening of bids.

Pig Iron.—With the exception of the usual number of orders for carload lots of foundry iron the market is quiet, most consumers having covered their requirements for the present. The Standard Steel Works Co., which inquired for 3000 to 4000 tons of low phosphorus iron, is understood to have closed on 3500 tons with a large eastern Pennsylvania producer. Purchases at present being confined to small lots, the basis of $19.50 per ton on foundry iron is evidently being maintained without difficulty. No sales of basic are reported. About 400 tons of Virginia iron was closed in this district last week.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.76
East. Pa. No. 1X	21.26
Basic (delivered eastern Pa.)	$19.50 to 20.00
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54 to 25.04
Virginia No. 2X, 2.25 to 2.75 sil.	25.04 to 25.54

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Billets.—Purchases are still of small tonnages, but have been slightly larger in number recently. Prices are unchanged at $33 per ton, Pittsburgh, for rerolling billets and $38 per ton for forging quality.

Bars.—The advance to 1.85c. per lb., base, Pittsburgh, by the Carnegie Steel Co., has been followed by

the independent producers of bars and a good flow of specifications against contracts is reported. Bids on 8000 tons of bars in the list of the Pennsylvania Railroad ranged from 1.95½c. to 2.05c. per lb., base, delivered Altoona, Pa., or 1.80c. per lb., base Pittsburgh, Johnstown, Struthers, Midland, Pa., Buffalo, Cleveland and Youngstown or f.o.b. Pennsylvania Railroad tracks.

Shapes.—All eastern Pennsylvania mills have not yet followed the advance of $1 a ton to 1.85c. per lb., Pittsburgh, 2c. per lb., Bethlehem, or 2.13c. per lb., delivered Philadelphia. There are a number of small fabricated projects under consideration and some large bridge work. Contract for the Detroit tunnel, which will require about 4000 tons of sheet steel piling, is reported to have gone to a New York contractor. Prices on 2000 tons of shapes on the Pennsylvania Railroad list were 1.95c., Bethlehem; 1.90c., Lackawanna, N. Y.; 1.80c., Pittsburgh; 1.75c., Pottsville; 1.95c., Phoenixville, and 1.80c., f.o.b. Pennsylvania Railroad tracks.

Plates.—The new quotation on plates of 2c. per lb., base, Coatesville, or 2.10c. per lb., Philadelphia, is effective with eastern Pennsylvania producers except for two mills, which are expected to advance in a few days. Specifications against contracts are reported in satisfactory volume. Bids on 25,000 tons of plates for the Pennsylvania Railroad were 1.80c. per lb., Pittsburgh, Harrisburg, Johnstown, Coatesville, Conshohocken, Pa., Cleveland, Youngstown and Steubenville, Ohio, Claymont, Del., and Weirton, W. Va., or f.o.b. Pennsylvania Railroad tracks.

Sheets.—Although local consumers including radio and automobile body makers have been purchasing small lots in addition to their contracts, the market still shows weakness. Makers of blue annealed sheets are endeavoring to maintain the 10c. per 100 lb. extra for widths greater than 40 in., but occasional concessions are reported. Black sheets are fairly firm at 2.75c. per lb., Pittsburgh. Galvanized sheets at 3.75c. per lb., base, are reported showing a tendency to weakness. Concessions have been given on desirable business.

Warehouse Business.—Following the brief period of activity that began with the new year, demand for material from stock has shown a slight decline. Prices are substantially unchanged, but competition for desirable orders is still keen and concessions are obtainable.

Imports.—In the week ended Jan. 21 a total of 2675 tons of iron, chrome and zirconium ores arrived at this port, of which 1750 tons was iron ore from Persia, 800 tons chrome ore and 125 tons zirconium ore from Brazil. Pig iron totaled 4750 tons; 2850 tons of British, 1495 tons of Indian and 405 tons of Dutch. Steel imports were all from Belgium and included 137 tons of shapes, 106 tons of bars, 52 tons of strip steel and 17 tons of bands.

Old Material.—Prices of all grades of scrap are showing a tendency toward firmness although demand has not increased. Consumers are reported to have good stocks of scrap on hand, but with better operation dealers foresee the development of some purchasing. Prices are unchanged.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	15.25 to 15.75
Bundled sheets (for steel works)	10.50 to 11.00
Machine shop turnings (for steel works)	11.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	11.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	13.00
Stove plate (for steel works)	13.00
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 12.00
Steel rails for rolling	15.00 to 15.50
Cast iron carwheels	15.50 to 16.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

W. H. DAVEY HEADS MERGER

New Empire Steel Corporation Elects President and 19 Directors

The Empire Steel Corporation, recently formed to merge six Ohio sheet mills, effected its organization at a meeting held in Cleveland, Jan. 23, by the election of a board of 19 directors and W. H. Davey, president of the Mansfield Sheet & Tin Plate Co., as president.

Other companies involved in the merger are the Ashtabula Steel Sheet Co., Ashtabula, Ohio; Thomas Sheet Steel Co., Waddell Steel Co. and Falcon Steel Co., Niles, and the Empire Steel Co., Cleveland.

With Mr. Davey there are on the directorate: H. S. Pickands, Pickands, Mather & Co, Cleveland; A. I. Davey, vice-president Mansfield company; C. F. Ackerman, Mansfield banker; C. H. Henkel, Mansfield attorney; M. C. Robinson, director of the Ashtabula company; Samuel, John, Harold and F. A. Davey, Mansfield; J. D. Waddell, president, and R. L. McCorkle, vice-president, Waddell Steel Co.; W. R. Jenkins, secretary Mansfield company; A. W. Wheatley, Lima, president Empire Steel Co.; E. C. Werner, Delphos, Ohio; C. S. Thomas, chairman of the Thomas Sheet Steel Co.; C. F. Smith, Youngstown, temporarily representing W. A. Thomas, president of the Thomas company; Lloyd Booth, president, and Paul Wick, vice-president, Falcon Steel Co.

Meetings of the stockholders will be held next week to ratify the merger, but it is stated that this will be merely formal action, as proxies have been secured from owners of the required number of shares. The merger will become operative as of Nov. 1, 1927. Headquarters will be in Mansfield.

SMALL INCREASE IN EXPORTS

Gain of 1927 Over 1926 Was Less Than 1 Per Cent—Imports Declined

WASHINGTON, Jan. 24.—Exports of iron and steel products from the United States during 1927 totaled 2,180,969 gross tons, against 2,167,213 tons in 1926. Imports for the two years amounted to 750,467 tons and 1,110,049 tons, respectively, according to preliminary figures of the Department of Commerce. Exports during December were 168,428 tons, compared with 177,928 tons in November. Imports in December totaled 64,188 tons, against 61,882 tons in November.

Tin plate was the principal item exported last year, with a total of 254,131 tons. Other products exported in large quantities during the year were boiler tubes and welded pipe, 248,415 tons, and scrap, 238,303 tons. Of the more outstanding imports structural shapes, with a total of 161,848 tons, led. Pig iron, 133,068 tons, and steel bars, 91,497 tons, were second and third. Receipts of cast iron pipe, 81,769 tons, were less than those of 1926 by 2104 tons.

Scrap made up the largest item of exportation in December, with 22,668 tons. Exports of boiler tubes and welded pipe aggregated 18,154 tons, and those of tin plate, 15,856 tons.

In the import movement in December structural shapes, totaling 14,529 tons, led, with pig iron, 14,299 tons, second. Receipts of steel bars totaled 8117 tons, cast iron pipe, 3112 tons, and "other pipe," largely seamless tubes, 1725 tons.

Engineering and other progress in modern Iceland will be outlined by Earl Hanson, explorer, at a meeting of the railroad division of the American Society of Mechanical Engineers, to be held at the Engineering Society Building, New York, March 1. Vilhjalmur Stefansson and other explorers have also been invited to address the meeting. In addition to engineering projects, Mr. Hanson will discuss special technical problems, manufacturing requirements, import and export trade and the economic possibilities of the island. He will also outline a proposed railroad project.

San Francisco

Oil Tanks Take 1000 Tons of Steel—Cast Iron Pipe Awards

SAN FRANCISCO, Jan. 21 (*By Air Mail*).—Oil storage tanks, awarded by the Petroleum Securities Co. of Los Angeles for its new Richmond, Cal., plant, call for 1000 tons of plates and shapes. The Western Pipe & Steel Co. got the business. Other awards included 1250 tons for a medical building in Los Angeles, taken by the Union Iron Works; 2237 tons of cast iron pipe for Portland, Ore., taken by the United States Cast Iron Pipe & Foundry Co., and 1521 tons of cast iron pipe for Spokane, Wash., divided between the latter company and the Pacific States Cast Iron Pipe Co.

Pig Iron.—Inquiries and sales during the week involved small lots only. The market is quiet. Prices continue unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—The only structural steel award of importance, other than the medical building in Los Angeles, mentioned above, was taken by Herrick Iron Works and called for 350 tons for the Women's Athletic Club, Oakland, Cal. Awards during the week totaled 2110 tons. Pending business is of fair proportions, the largest new inquiry involving 270 tons for an apartment house in San Francisco. Plain material is firm at 2.35c., c.i.f. Coast ports.

Plates.—The award of oil storage tanks by the Petroleum Securities Co. involved two 80,000 bbl. and five 21,000 bbl. tanks. In addition, three 100,000 bbl. tanks will be erected, the material for these tanks having been purchased and fabricated over a year ago. The Steel Tank & Pipe Co. sold 250 tons additional for the Port Townsend, Wash., pipe line, bringing the total to 850 tons. Bids will be taken on Jan. 27 for the second unit of this project, involving about 16,000 ft. of 24 in. riveted pipe. Prices continue firm at 2.25c., c.i.f.

Bars.—The largest reinforcing bar award involved 326 tons for the Stony Gorge Dam at Orland, Cal., 281 tons going to the Pacific Coast Steel Co. and the balance to the Laclede Steel Co. Pending business exceeds 6000 tons. Prices in the San Francisco district are by no means firm, and out-of-stock material continues to be quoted around 2.25c.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. took 2237 tons of 6 to 12 in. De Lavaud and 18 to 24 in. class B pipe for Portland, Ore. Spokane, Wash., placed 1253 tons of 1¼ to 8 in, class 150 pipe with the Pacific States Cast Iron Pipe Co. and 268 tons of 12 in. class 150 to the United States Cast Iron Pipe & Foundry Co. The Walworth Co. of Oregon took 340 tons of 4 to 12 in. class D pipe for The Dalles, Ore., and Roy & Titcomb, Inc., Tucson, Ariz., secured 373 tons of 2 to 10 in, class B pipe for Nogales, Ariz. The United States Cast Iron Pipe & Foundry Co. was awarded 100 tons of 4 to 10 in. class B pipe. New and pending business includes 1244 tons of 6 to 12 in. class C and D pipe for Vancouver, B. C.; 651 tons of 4 to 12 in. class B for Lafayette, Colo., and 130 tons of 4 to 8 in. class B for Chehalis, Wash. Bids have been opened on 188 tons of 4 to 8 in. class B for Chowchilla, Cal., and on 271 tons of 2 to 10 in. class C pipe for the improvement of Twenty-eighth Street, San Diego, Cal. R. H. Downer, San Diego, was low bidder on 155 tons of 4 to 6 in. class B pipe for the improvement of Boundary Street, San Diego.

Steel Pipe.—Lafayette, Colo., will take bids on Jan. 31 for 146 tons of 4 to 12 in. standard pipe and will also take alternate bids on cast iron pipe.

Coke.—A large shipment of English beehive and by-product coke is due on the Coast next week and will be divided between consumers in the Los Angeles and San Francisco districts. Most of this shipment is to apply against contracts placed some time ago. Demand is fair. Prices are unchanged.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.35
Cement coated nails, 100-lb. keg	3.35

Birmingham

Basic Pig Iron $1 Lower—Plates, Shapes, Bars $1 Higher

BIRMINGHAM, Jan. 24.—New pig iron business is scattered and irregular. There is some tonnage in small lots, but most of the requirements for January and part of February have been placed. Quotations for foundry are still on a $16 base. Basic iron is being quoted by one producer at $15. The other two producers of basic are using their own production. The Tennessee Coal, Iron & Railroad Co. blew out Bessemer No. 1 furnace on Jan. 20. This company is operating only six of 12 blast furnaces. There are now 17 furnaces in blast in Alabama.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$16.00
No. 1 foundry, 2.25 to 2.75 sil.	16.50
Basic	15.00

Finished Steel.—Plates, bars and structural shapes have again been advanced $1 per ton. Inquiries are holding up well and new business has been in fair volume. The Tennessee company has placed another open-hearth furnace in operation and now has 12 producing, eight at Ensley and four at Fairfield. The Gulf States Steel Co. continues with four.

Cast Iron Pipe.—Considerable tonnage in prospect from the larger cities is slow in materializing. Dallas, Tex., opened bids last week on a tonnage.

Coke.—Quotations remain at $5. The new by-product unit of the Tennessee Coal, Iron & Railroad Co., consisting of 63 Koppers ovens of the Becker type, will be completed in February.

Old Material.—Buying was a little better last week and more tonnage was moved.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$9.50 to $10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 14.00
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.

	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	70
Less than 100 lb	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb	50

St. Louis

Better Business in Plates for Oil Tanks —Scrap Is Weaker

ST. LOUIS, Jan. 24.—Sales of pig iron during the last week included 2100 tons, mostly malleable, booked by the Granite City maker, and 1400 tons sold by a leading Southern maker. Melters of malleable are beginning to enter the market. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Another cold wave has brought a revival of buying of domestic grades of coke. Buying of industrial grades is only fair.

Finished Iron and Steel.—The advance of $1 on bars, plates and shapes made by subsidiaries of the United States Steel Corporation and by the Inland Steel Co. is regarded by some interests as stimulating to sales, while others feel that the time is not ripe for higher prices. The Granite City mill, which has not advanced its price on plates, reports a better business on this item as the result of renewed interest in the oil trade. Business is extremely dull with fabricators of structural steel, and operations of their plants in the district are between 40 and 50 per cent of capacity. New reinforcing bar trade is light.

Old Material.—The combination of a halt in buying by consumers and the dumping of a great amount of old material in this market caused a weakness in the market and lower prices. Railroad lists were heavy, and many dealers in the territory contiguous to St. Louis, who had been holding for higher prices, decided to sell at the same time, seeming to sense a break in the market. A leading mill bought a round tonnage of melting steel at the lower prices. Railroad lists include: Chesapeake & Ohio, 5800 tons; Wabash, 1800 tons; Great Northern, 64 carloads; Nickel Plate, 30 carloads; Memphis Street Railway, 300 tons; Chicago, Milwaukee & St. Paul, 1200 tons; Terminal Railway Association (St. Louis), 2800 tons, and Frisco, 17 carloads.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$12.50 to $13.00
No. 1 locomotive tires	14.00 to 14.50
Heavy shoveling steel	12.50 to 13.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	14.25 to 14.75
Railroad springs	15.00 to 15.50
Bundled sheets	9.00 to 9.50
No. 2 railroad wrought	12.50 to 13.00
No. 1 busheling	10.50 to 11.00
Cast iron borings	9.25 to 9.75
Iron rails	14.00 to 14.50
Rails for rolling	15.25 to 15.75
Machine shop turnings	8.00 to 8.50
Steel car axles	20.00 to 20.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	11.50 to 12.00
Steel rails, less than 3 ft.	15.75 to 16.25
Steel angle bars	14.00 to 14.50
Cast iron carwheels	14.25 to 14.75
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	14.00 to 14.50
Agricultural malleable	12.50 to 13.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Port Henry-Waterbury Pig Iron Freight Rate Held Reasonable

WASHINGTON, Jan. 24.—The rate of $3.65 per gross ton on pig iron from Port Henry, N. Y., to Waterbury, Conn., is not unreasonable, according to an opinion of the Interstate Commerce Commission made public last Saturday in which it ordered dismissal of a complaint by the Manufacturers' Foundry Co., Waterbury. The complainant sought reparation and a future rate on the basis of the rate of $3.15 from Port Henry to Bridgeport, Conn.

Buffalo

Plates, Shapes and Bars Now $1 Higher at Lackawanna Mill

BUFFALO, Jan. 24.—A Buffalo furnace is understood to have taken 1000 tons of malleable pig iron for the Watertown, N. Y., plant of the New York Air Brake Co. for second quarter delivery. The Worthington Pump & Machinery Corporation has placed 700 or 800 tons, of which about 200 tons was for the Buffalo plant. A New England consumer bought 200 to 300 tons of foundry iron. Inquiry has narrowed to small lots.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2X foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—The Bethlehem Steel Co. has announced an advance of $1 a ton on plates, shapes and bars, making its present quotation at the Lackawanna plant 1.95c. for the remainder of the quarter. Inquiry for bars, shapes and plates holds at about the same volume. Sheet inquiry is good, and very little black sheet business is going at less than 2.90c. Automobile body sheets range from 4c. to 4.10c. Sheet mill operation continues at 85 per cent. Wire mills report good shipments of wire cloth and poultry netting. The fence department of the Wickwire company is being moved from Clinton, N. Y., to Buffalo.

Old Material.—There has been a strengthening in prices, headed off by No. 1 heavy melting steel, which is now $15 to $15.50. One of the mills has called for increased shipments and dealers who now have to buy against this old order are paying as much for the scrap as they are receiving. Foundry grades are very quiet and production of turnings and borings is very light.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	13.25 to 13.50
Scrap rails	13.75 to 14.25
Hydraulic compressed sheets	13.50 to 14.00
Hand bundled sheets	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
No. 1 busheling	14.00 to 14.50
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.00 to 9.25
Acid Open-Hearth Grades	
Railroad knuckles and couplers	16.00 to 16.50
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phosphorus billet and bloom ends	15.75 to 16.00
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	16.25 to 16.75
No. 1 railroad wrought	12.50 to 13.00
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	12.75 to 13.00
Locomotive grate bars	10.50 to 11.00
Steel rails, 3 ft. and under	16.50 to 17.00
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	15.00 to 15.50
Agricultural	15.00 to 15.50
Industrial	15.00 to 15.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb.	3.90

Cincinnati

Slight Increase in Pig Iron Sales—Scrap Market Weaker

CINCINNATI, Jan. 24.—The pig iron market has a better tone. This is evidenced by a slight increase in sales during the past week. While the foundry melt in this district is still at a low point, indications are that operations will expand by the end of the month. Open inquiries are meager, but small-lot buying is being done by many consumers to tide them over the first quarter. At Ironton, Ohio, the one active furnace is reported to be piling considerable iron, and another producer has reduced its stock pile a fair amount in the past few months. The price there remains firm at $19, base furnace. Northern Ohio makers are understood to be selling some iron in southern Ohio at $16.50, base furnace, although there is a more noticeable tendency to quote higher figures. Tennessee and Alabama iron are unchanged at $16, base Birmingham, but sales north of the Ohio River have been unimportant. The movement of silvery iron from Jackson County furnaces is only fair. Prices are steady at $25, base furnace, for 8 per cent.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.69
Alabama fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—The announcement of an increase of $1 a ton in the prices of bars, structural shapes and plates and the expansion of the demand for sheets have been factors in giving added strength to the finished steel market. There has been an improvement in the position of many small fabricators in the past week, an influx of jobs ranging from 100 tons downward having been responsible for the betterment. However, there has been a noticeable absence of sizable projects, although indications are that several good inquiries will come out within the next few weeks. Sheet consumers are specifying more heavily against first quarter contracts, and the outlook is favorable for continued operations of mills in this territory at a high rate of production. While some of the bookings have been from automobile manufacturers, buying has been well distributed among all consuming industries and jobbers. Prices are holding well in all varieties of sheets except galvanized stock for roofing purposes, in which a deviation from the established quctations have been noted in the South. Local wire jobbers are continuing to receive common wire nails by barge from Ironton, Ohio. Mills are asking $2.55 per keg, base Pittsburgh or Ironton. Sales of cold-rolled bars have increased somewhat, and orders for spikes have been liberal.

Warehouse Business.—There has been an improvement in sales in the past week, and jobbers now are of the opinion that the volume of business in January will exceed that of December. Prices are unchanged.

Coke.—While by-product foundry coke specifications from the automobile industry have been fairly good, the improvement in that direction has been offset by the curtailment of production in jobbing foundries. The result is that shipments in January will be little more than in December. Sales of by-product domestic grades have been about 50 per cent above those of December. The present scale of prices probably will remain undisturbed during February, although no formal announcement has been made.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Signs of weakness have cropped out. Steel mill operations are trending upward slowly, but plants are willing to buy scrap only on an exceptionally desirable basis. A Portsmouth, Ohio, company last week purchased heavy melting steel and cast iron borings at delivered prices of $14.25 and $11.50, respectively. Foundries nearby are taking scattered lots of material, but in the aggregate their consumption has been small.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$11.75 to $12.25
Scrap rails for melting	12.50 to 13.00
Loose sheet clippings	9.00 to 9.50
Bundled sheets	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 1 railroad wrought	11.50 to 12.00
Short rails	17.00 to 17.50
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	16.00 to 17.00
No. 1 railroad cast	13.50 to 14.00
Burnt cast	8.00 to 8.50
Stove plate	9.25 to 9.75
Brake shoes	10.00 to 10.75
Railroad malleable	12.75 to 13.25
Agricultural malleable	12.25 to 12.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Canada

Forward Buying of Pig Iron Declines—Scrap Prices Are Weak

TORONTO, ONT., Jan. 24.—Fully 75 per cent of the melters of pig iron are estimated to have covered their requirements for the near future, and the volume of forward buying has declined. Sales during the past week were mostly small lots for prompt shipment. Production of pig iron in Canada has received a setback due to an explosion in No. 3 furnace at the plant of the Algoma Steel Corporation, Sault Ste. Marie, Ont., and until repairs are made the company will have only one furnace in blast. Price shading on pig iron is believed to be less prevalent than last month.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	25.00
No. 2 foundry, sil. 1.75 to 2.25	25.00
Malleable	25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—Toronto and Montreal scrap markets show very little change. Hamilton, Ont., consumers are taking more interest. Prices are weak, but have not been revised.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Boston

Eastern Pig Iron Selling at Low Prices in New England

BOSTON, Jan. 24.—Pig iron sales in New England the past week were not much more than 3000 tons, 90 per cent being by furnaces east of Buffalo. While a firmer tendency is noted in other sections of the country, prices on iron from furnaces east of Buffalo are weaker in New England because of keen competition and varying freight rates. At certain New England points No. 2X has been sold on a delivered basis equivalent to $16.50 a ton furnace, Buffalo, or less. No. 2 plain was offered last week at $21.02 a ton delivered, as against $21.41 for Buffalo iron, while No. 1X is available at $21.40 delivered, contrasted with $21.91 to $22.41 for Buffalo iron and $24.15 for eastern Pennsylvania iron. There is no established basis, for while these low prices prevail, others equivalent or almost equivalent to the full Buffalo furnace quotations have been obtained. A New York furnace took 300 tons, silicon 2 to 2.50, from a New Hampshire machinery manufacturer, against a lower bid from the Mystic stack, which helps to illustrate the mixed condition of the market. Iron sold the past week calls for deliveries running into the second quarter. A Worcester, Mass., plant is expected to close on 1000 tons this week, part No. 2 plain and part No. 2X.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.41 to $21.91
Buffalo, sil. 2.25 to 2.75	21.91 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15
East. Penn., sil. 2.25 to 2.75	23.65
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Shapes and Plates.—McClintic-Marshall Co. and the New England Structural Co. jointly have been awarded the fabrication of 15,000 tons of steel for the New England Building to be erected in the Park Square district, Boston. This tonnage is the largest ever awarded in New England for a building. The Bethlehem Steel Co. will furnish the plain material. The market for plates and standard shapes is 1.80c. to 1.85c. per lb., base Pittsburgh.

Coke.—Contrary to intimations made last week by by-product foundry coke interests that a change in price was expected before Feb. 1, it is definitely established the price will remain at $11.50 a ton delivered within a $3.10 freight rate zone until March 1. No improvement in the movement of foundry coke is reported. The price for domestic coke remains at $8.50 a ton ovens, Everett, Mass., or the equivalent.

Cast Iron Pipe.—Watertown, Mass., has placed 1000 tons of 6 to 16-in. pipe with the Warren Foundry & Pipe Co. Massachusetts has purchased 400 tons of 6 to 12-in. pipe from the United States Cast Iron Pipe & Foundry Co. for a hospital. Medford, Mass., has placed 250 tons of 6 to 12-in. pipe with R. D. Wood & Co. Malden, Mass., closes bids today on 300 tons of pipe, various sizes. Stone & Webster, Inc., has yet to close on 2000 tons of gas pipe for its 1928 requirements. Private water pipe business continues quite brisk. For large pipe the market remains unsettled. On private business 4-in. pipe is selling at $45.10 to $46.10 a ton, delivered common Boston freight rate points, and 6 to 12-in. at $41.10 to $42.10. The usual $5 differential is asked on class A and gas pipe.

Cold-Rolled Strip Steel.—Sales have quickened somewhat for deliveries extending late into the first quarter. The undertone of the market is firmer.

Imports.—Receipts of pig iron at Boston for the first half of January were 1282 tons, made up of 750 tons of English, 237 tons of Dutch and 295 tons of Indian. Imports in the first half of December were 594 tons.

Mill Prices on Cold-Rolled Strip in North Atlantic States: In 1 to 3-ton lots, 3.25c. per lb., base Pittsburgh, and also, 3.25c. to 3.40c. per lb., base Worcester, Mass.

Old Material.—Old material is slightly more active. With the exception of scrap rails, which are about 25c. a ton cheaper, scrap prices are holding and in some instances are firmer. Skeleton the past week moved more freely, generally at $6 to $6.50 on cars shipping point, and in at least one instance at $7, and this statement applies also to forge flashings. Pipe is more active and 50c. a ton higher. Steel turnings generally are selling at $6 to $6.50 a ton on cars, but one broker is paying $6.10. The shafting market, dull a week ago at $13 to $13.50 a ton because of the withdrawal of a Maine mill from the market, today is $13.25 to $14 for Pennsylvania delivery. For New England delivery, there is an abundance of textile machinery cast at $14 to $15 a ton delivered, with $14 to $14.50 having been paid. No. 1 machinery cast was sold the past week at $16 a ton, delivered on a high freight rate, whereas the average transaction is at $14.50 or $15. A Massachusetts brake shoe maker is paying $11 a ton for stove plate. The Boston & Maine Railroad closed bids today on 80 cars of miscellaneous material.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.00 to $9.25
Scrap rails	8.50 to 8.75
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Machine shop turnings	6.00 to 6.50
Cast iron borings (steel works and rolling mill)	6.00 to 6.25
Bundled skeleton, long	6.00 to 6.50
Forge flashings	6.00 to 6.50
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	6.00 to 6.50
Shafting	13.00 to 13.50
Steel car axles	15.50 to 16.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.00 to 8.50
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton delivered consumers' yards:

Textile cast	$14.00 to $14.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00
Railroad malleable	13.00 to 13.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3,365c.
Tees	3.365c.
Zees	3.465c.
Soft Steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

The American Demag Corporation, 310 South Michigan Avenue, Chicago, was recently incorporated to sell in the United States the products of the Demag Co., Duisburg, Germany. The German company is a leading builder of steel plants, rolling mills, seamless tube mills, cold drawing machinery and harbor dock equipment in Europe. It recently acquired the Thyssen Machine Co., builder of heavy mill machinery and gas engines. H. A. Brassert & Co., Chicago, are affiliated with the American corporation and K. W. Atwater, who has been one of the American representatives of the German company, is vice-president.

Pacific Northwest

Expected Improvement in Steel Business Slow to Develop

SEATTLE, Jan. 20 (*By Air Mail*).—The increase in steel orders expected this month has failed to materialize, and conditions in the local steel trade are quiet. While the outlook is hopeful there is nothing in sight to indicate when conditions will improve.

Pig Iron.—Sales are few and involve small lots only. Prices remain unchanged. Utah No. 2 foundry and basic are quoted at $24 to $25 per gross ton, Seattle delivery.

Plates and Shapes.—The local market is very quiet. The only worthwhile jobs placed in the past week were 1000 tons of shapes for the new plant of the Union Bag & Paper Co. at Tacoma, taken by the United States Steel Products Co. and 672 tons for the Argo crossing in Seattle. Much new work is in sight, but it is very slow in coming out. Shapes are quoted at 2.30c. and plates at 2.25c., Seattle delivery.

Sheets.—Demand is very quiet for black and blue annealed, but for galvanized is fairly active. Prices are unchanged: No. 24 galvanized a. 4.35c.; No. 24 black, 3.50c., and Nos. 9 and 10 blue annealed, 2.75c., Seattle.

Bars.—New work is entirely in small lots, but a good deal is in sight which may not be placed for some time. The new Bon Marche store, the Beacon Hill tunnel, two large apartments and additions to the Elks' Temple and the Olympic Hotel will take 5000 tons or more. Prices range from 1.85c. to 2.25c., depending on the size and desirability of the order.

Hoops and Bands.—Foreign hoops have been sold for delivery at nearby consuming points at $3 per ton or more below domestic prices. Domestic hoops and bands are quoted at 2.73c., Seattle.

Detroit Scrap Market Weak; Pig Iron Shipments Large

DETROIT, Jan. 24.—Prices on old material in this district have not changed during the past week, but the tone of the market is slightly weaker. This has no doubt been brought about by high operations at producing plants and also because mills and furnaces have not bought as heavily or as far in the future as was expected.

Pig iron shipments are on a high basis with indications that the February melt will be above that of January.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling Steel	$12.00 to $12.50
Boring and short turnings	9.00 to 9.50
Long turnings	7.75 to 8.25
No. 1 machinery cast	16.00 to 17.00
Automobile cast	18.00 to 19.00
Hydraulic compressed sheets	10.75 to 11.25
Stove plate	11.50 to 12.50
No. 1 busheling	9.50 to 10.00
Sheet clippings	7.50 to 8.00
Flashings	10.00 to 10.50

Navy Department Awards Steel

WASHINGTON, Jan. 24.—The Carnegie Steel Co. has been awarded the contracts to furnish 2317 tons of special treatment plates and 110 tons of shapes for modernization of the battleships Oklahoma and Nevada. The Pacific Coast Steel Co. has been awarded a contract to supply 137 tons of shapes and the Bethlehem Steel Co. 102 tons of shapes for light cruisers Nos. 28 and 29. There are additional small tonnages still to be awarded for the latter two ships.

Carnegie Steel Co. Making Floor Plate

The Carnegie Steel Co. has engaged in the manufacture of floor plate of the raised pattern type which is furnished in thicknesses ranging from 3/16 to 3/4 in. and in widths to 66 in.

FEWER CASTINGS IN 1927

Bookings 12 Per Cent Below 1926 for Commercial Steel Castings—Output Down 16 Per Cent

WASHINGTON, Jan. 24.—Showing an increase of 14,025 tons, orders for commercial steel castings totaled 74,939 tons in December, against 60,914 tons in November. For the 12 months they aggregated 875,146 tons, compared with 996,266 tons in 1926, according to reports received by the Department of Commerce from 123 manufacturers. Production in December amounted to 56,414 tons, against 56,935 tons in November. For the year the total was 920,657 tons, compared with 1,095,166 tons in 1926.

Bookings in December represented 56 per cent of capacity, against 46 per cent in November. Of the December bookings, 38,266 tons was for railroad specialties, representing 64 per cent of this class of capacity, against 26,752 tons, or 45 per cent, in November. Bookings of railroad castings for the year amounted to 358,422 tons, or 50 per cent of capacity, against 382,478 tons, or 53 per cent, in 1926. Bookings of miscellaneous castings in December totaled 36,673 tons, or 50 per cent of capacity, against 34,162 tons, or 47 per cent, in November. For the year, bookings of miscellaneous castings totaled 516,724 tons, or 43 per cent of capacity, compared with 613,788 tons, or 70 per cent, in 1926.

Of the December output 18,671 tons was in railroad specialties, representing 31 per cent of capacity, against 18,046 tons, or 30 per cent of capacity, in November. Production of railroad specialties last year aggregated 343,716 tons, or 48 per cent of capacity, against 403,416 tons, or 56 per cent, the year previous. Production of miscellaneous castings in December amounted to 37,743 tons, or 52 per cent of capacity, against 38,889 tons, or 53 per cent, in November. Nineteen hundred and twenty-seven production of this kind of castings totaled 576,941 tons, or 66 per cent of capacity, against 691,750 tons, or 79 per cent, in 1926.

Obermayer Contest for Foundry Devices Announced for 1928

The 1928 Obermayer prize of the American Foundrymen's Association will be given to the person submitting a device, drawing or model of some jig or method, which, in the opinion of the judges, embodies the best ideas for economical production of castings. The entries in this prize contest will be on display at the Philadelphia meeting the week of May 14. Devices which have been prize winners in the past were:

Rochester meeting, 1922: A fixture for making green sand cores of two fittings in a single box.

Cleveland meeting, 1923: A device used in making 12-in. chilled mine car wheels.

Milwaukee meeting, 1924: A roller gagger and core rod mold former.

Syracuse meeting, 1924: A continuous device for recording temperatures of iron at the cupola spout.

Detroit meeting, 1926: A safety device for raising cupola drop bottom doors.

Those who contemplate entering this contest should notify the secretary of the American Foundrymen's Association, 140 South Dearborn Street, Chicago.

Record Production of Portland Cement

Production of Portland cement in the United States in 1927 is reported by the Bureau of Mines at 171,908,000 bbl. This is an increase of about 4½ per cent over the 1926 production of 164,530,000 bbl. Each in turn was a new high record. Nearly one-quarter of the entire amount came from eastern Pennsylvania, New Jersey and Maryland, which produced slightly less than in 1926, when the contribution of this area was a little more than one-quarter of the total.

Production reached a peak in August, 1927, at 18,315,000 bbl. This was about 7 per cent ahead of the highest month of 1926, which was July, with 17,134,000 bbl. Five months of 1927 exceeded the largest month of any previous year.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Jan. 24	Jan. 23	Jan. 21	Jan. 20	Jan. 19	Jan. 18
Lake copper, New York	14.25	14.25	14.25	14.25	14.25	14.25
Electrolytic copper, N. Y.*	13.87½	13.75	13.75	13.75	13.75	13.80
Straits tin, spot, N. Y.	55.37½	55.62½	....	55.00	54.50	54.37½
Lead, New York	6.50	6.50	6.50	6.50	6.50	6.50
Lead, St. Louis	6.30	6.30	6.30	6.30	6.30	6.30
Zinc, New York	6.00	6.00	5.95	5.95	5.97½	5.97½
Zinc, St. Louis	5.65	5.65	5.60	5.60	5.62½	5.62½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Jan. 24.—Practically all of the markets are quiet but firm. Concessions in copper have practically disappeared and export sales have increased. Some activity in tin has developed, with prices a little higher. The lead market is unchanged. Some strength has appeared in zinc after a week of lower prices.

Copper.—Sales yesterday and today of considerable electrolytic copper for export have somewhat changed the complexion of the market. A few custom smelters, who were shading the price of leading producers, have practically ceased such tactics and the market is virtually on a basis of 14.12½c., delivered in the Connecticut Valley. Sales during the week, as low as 14c., delivered, are noted, but the volume was not large. There were also some sales at the price of leading producers. Export demand amounted to about 2500 tons Monday, and today it was expected that this total would be equalled, Germany being the principal buyer. As a result of the export demand, inquiry from domestic consumers has become somewhat more lively. The official quotation of Copper Exporters, Inc., is unchanged at 14.50c. c.i.f. usual European ports. A fair business has been done in Lake copper recently and the quotation is unchanged at 14.25c., delivered, with some sales at 14.30c.

Tin.—Sales for the week ended Saturday, Jan. 21, were about 1200 tons. The business consisted mostly of trading between dealers, consumers being quite inactive. Some London houses were anxious for orders and pressed hard to obtain business. Most of the week the market was sluggish and heavy despite the fair amount of business done. Prices in the week have advanced, although transactions yesterday and today have been in very moderate volume. Spot Straits tin was quoted today 55.37½c., New York. Arrivals thus far this month have been 4015 tons, with 5675 tons reported afloat.

Lead.—The market has been moderately active and a fair business has been done for January and early February delivery. The quotation of the leading interest is unchanged at 6.50c., New York. Prices in the outside market are 6.30c., St. Louis, although during the last week some resale metal changed hands as low as 6.25c.

Zinc.—Yesterday and today the market for prime Western zinc is a little stronger, following quotations last week which, at 5.60c., St. Louis, were equal to the low level of 1927. Partly because of better conditions in the ore district, quotations yesterday and today were on a basis of 5.65c., St. Louis. Although the price of ore is still $36, Joplin, production and sales were each about 12,000 tons last week. Producers of zinc report a fair amount of inquiry and business.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c., and electrolytic nickel at 37c. per lb.

Antimony.—A fairly large consuming demand recently is reported, but market quotations are practically unchanged for Chinese metal at 11c. for spot and 11.25c. for futures, New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in ingots is quoted 23.90c., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Jan. 24.—A fair volume of business is being transacted in all commodities except lead. Inquiry

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	57.50c. to 58.50c.
Tin, bar	59.50c. to 60.50c.
Copper, Lake	15.25c.
Copper, electrolytic	15.00c.
Copper, casting	14.25c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.65c. to 8.65c.
Lead, bar	9.90c. to 10.90c.
Antimony, Asiatic	13.00c. to 13.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	39.25c. to 40.25c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	60.50c.
Tin, bar	62.50c.
Copper, Lake	15.25c.
Copper, electrolytic	15.25c.
Copper, casting	14.50c.
Zinc, slab	7.75c.
Lead, American pig	7.25c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	19.75c.
Babbitt metal, high grade	65.25c.
Solder, ½ and ½	36.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	22.75c. to 23.75c.
Copper, cold rolled, 14 oz. and heavier	25.25c. to 26.25c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.50c. to 25.50c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

No changes in mill prices of bronze, brass and copper products have occurred since the advances of Dec. 5. Zinc sheets and lead full sheets have not changed since Aug. 5 and Dec. 1, respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Zinc	10.00c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	23.62½c.
Copper	24.50c.
Rods—	
High brass	16.50c.
Naval brass	19.25c.
Wire—	
Copper	15.75c.
High brass	19.25c.
Copper in Rolls	21.75c.
Brazed Brass Tubing	26.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machne rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz and heavier	25.00c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.12½c.
Copper	26.00c.
Brazed Brass Tubes	26.75c.
Brass Rods	16.50c.

for zinc for delivery in March and April is brisk. The old metal market is dull and prices are weak.

Prices, per lb., in carload lots: Lake copper, 14.25c.; tin, 56.75c.; lead, 6.35c.; zinc, 5.70c.; in less-than-carload lots, antimony, 12.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.25c.; pewter, No. 1, 34c.; tin foil, 40c.; block tin, 50c.; aluminum, 12.50c.; all being dealers' prices for less-than-carload lots.

REINFORCING STEEL

Awards of 9500 Tons Include 8000 Tons For Plants in Chicago and Boston

Awards of more than 9500 tons included 5000 tons for the Boston-Cambridge, Mass., plants of Sears, Roebuck & Co. and 3000 tons for the Campbell Soup Co. plant in Chicago. New projects reported totaled only about 900 tons, less than any week since the first of the year. Included in new business was 400 tons for an apartment building in Chicago. Awards follow:

BOSTON-CAMBRIDGE, 5000 tons, Sears, Roebuck & Co. plants, to Concrete Steel Co.

PROVIDENCE, R. I., 125 tons, Court House, to Truscon Steel Co.

ROCHESTER, N. Y., 180 tons, State hospital, to unnamed local contractor.

PITTSBURGH, 360 tons, Grant Building; 160 tons to Truscon Steel Co., and 200 tons to Carlem Engineering Co.

CHICAGO, 3000 tons of rail steel bars, plant for Campbell Soup Co., to Calumet Steel Co.

MARSHALLTOWN, IOWA, 200 tons, hotel, to Concrete Engineering Co.

ST. LOUIS, 220 tons, apartment buildings, to Laclede Steel Co.

ORLAND, CAL., 326 tons, Stony Gorge dam; 281 tons to Pacific Coast Steel Co., and 45 tons to Laclede Steel Co.

SEATTLE, 100 tons, Bartell Drug Co., to Pacific Coast Steel Co.

SEATTLE, 110 tons, Queen Anne High School addition, to Pacific Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BUFFALO, 100 tons, seven County bridges; bids opened Feb. 7.

CHICAGO, 400 tons, apartment building at 222 Chestnut Avenue.

RIVERSIDE, CAL., 120 tons, Victoria Avenue bridge; bids opened.

SEATTLE, WASH., 2500 tons, Bon Marche department store; bids soon.

SEATTLE, 1000 tons, Weaver Street bridge; bids being taken.

SEATTLE, 1000 tons, Beacon Hill tunnel; bids being taken.

ELYRIA, OHIO, 300 tons, sewage disposal plant.

Total apparent consumption of babbitt metal in 1927 was 60,111,843 lb., as against 65,934,782 lb. in 1926, according to reports received by the Department of Commerce from 31 firms. Sales by manufacturers in 1927 amounted to 47,003,959 lb., and consumption by producers to 13,107,884 lb., comparing with 50,555,110 lb. and 15,379,672 lb. respectively in 1926. Total apparent consumption in December was 4,465,787 lb., compared with 4,505,954 lb. in November.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.00c.	13.50c.
Copper, heavy and wire	11.75c.	12.875c.
Copper, light and bottoms	9.75c.	11.00c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.75c.
No. 1 yellow brass turnings	7.75c.	8.75c.
No. 1 red brass or composition turnings	8.75c.	9.75c.
Lead, heavy	5.25c.	5.625c.
Lead, tea	4.25c.	4.75c.
Zinc	3.75c.	4.25c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.75c.	14.50c.

RAILROAD EQUIPMENT

Inquiries for About 500 Cars But Orders Are For Minor Lots

Although expectations are that railroad equipment buying will show a new spurt soon, the week's business amounted only to a few small purchases and inquiries for about 500 cars. Details follow:

Government of Siam has ordered eight locomotives from Baldwin Locomotive Works.

Wilson & Co., Chicago, have made inquiry for 300 40-ton refrigerator cars.

Northern Pacific has ordered 50 caboose car underframes from Siems-Stembel Co.

Western Lumber Co. has ordered one Prairie-type locomotive from Baldwin Locomotive Works.

Great Northern has placed an order for eight 30-cu. yd. air-dump cars with Koppel Industrial Car & Equipment Co.

Sloss-Sheffield Steel & Iron Co. has ordered one consolidation type locomotive from Baldwin Locomotive works.

Toronto, Hamilton & Buffalo has placed an order for two 2-8-4-type locomotives with Montreal works of American Locomotive Co.

Texas & Pacific has ordered two business cars from American Car & Foundry Co.

Southern Railway has ordered one baggage and mail car from Bethlehem Steel Co., in addition to 25 cars reported some time ago.

Standard Oil Co. of New Jersey is inquiring for 12 all-steel 50-ton box cars.

Republic Iron & Steel Co. is inquiring for 50 70-ton gondola car bodies.

Manila Railroad has ordered 50 flat cars from Gregg Co. and has made inquiry for 50 box cars.

Lake Superior & Ishpeming will buy 250 ore cars.

New York, Westchester & Boston Railway has ordered 10 additional electric passenger cars from Westinghouse Electric & Mfg. Co.

Universal Pipe & Radiator Co. Plans Expansion

The Universal Pipe & Radiator Co., 420 Lexington Avenue, New York, has proposed to its stockholders an increase in the authorized common stock of the company from 400,000 to 3,000,000 shares, for the reported purpose of acquiring additional properties. In a letter to the stockholders of the company calling a special meeting for Feb. 15, President Louis B. Ladoux said in part:

In connection with the rapid growth of the business of your company, the management has for the past few years pursued a policy of diversification with the idea of offsetting the seasonal fluctuations in the building and allied trades. In line with this policy, the business of the company has recently been extended to include through its subsidiaries, the manufacture of railroad brake shoes, the operation of by-product ovens and the manufacture of artificial stone for ornamental purposes. Plans for further expansion are being considered which, if consummated, would greatly strengthen your company.

The Universal Pipe & Radiator Co. was incorporated in 1923 to take over the properties of the Iron Products Corporation, the Central Foundry Co. and the Central Radiator Co. It is also the holding company of the Essex Foundry Co., Newark, N. J., the Molby Boiler Co., Lansdale, Pa., and the Chattanooga Iron & Coal Corporation, Chattanooga, Tenn.

FABRICATED STRUCTURAL STEEL

Cleveland Award of 57,800 Tons Brings Week's Total to 103,000 Tons

Marked by two structural steel awards of unusual size, 57,800 tons for the Cleveland Union Terminals, Cleveland, and 15,000 tons for a building in Boston, the week's total of fabricated steel contracts exceeded 103,000 tons. Other outstanding awards were 8000 tons for a bank building in Chicago and 7000 tons for subway work in New York. Awards follow:

ALLERTON, N. J., 350 tons, Packers' Island bridge for New Jersey State Highway Commission, to Phoenix Bridge Co.

PHILADELPHIA, 115 tons, Fern Rock Terminal for Department of City Transit, to Montgomery Iron & Steel Co.

CLEVELAND, 57,800 tons, railroad station, department store building, garage and Huron Road viaduct, as part of Cleveland Union Terminals project, to American Bridge Co.

BOSTON, 15,000 tons, New England Building, to McClintic-Marshall Co. and New England Structural Co.

NEW YORK, 900 tons, tunnel shields for Fulton Street tunnel, to Biggs Boiler Works Co., Akron, Ohio.

NEW YORK, 7000 tons, section 13, route 107 of subway, to McClintic-Marshall Co.

NEW YORK, 700 tons, apartment building on East Twenty-second Street, to Easton Structural Steel Co.

NEW YORK, 700 tons, apartment building on Forty-third Street, to Harris Structural Steel Co.

NEW YORK, 550 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: Office building at Franklin Avenue and Fifteenth Street, Flushing; apartment building on Scotland Road, East Orange, State Bank at Eighth Avenue and Forty-third Street and inclosures for sledge beds for Barnes Engineering Co. at Lodi, N. J., to Lehigh Structural Steel Co.

FLUSHING, N. Y., 200 tons, apartment building, to an unnamed fabricator.

STATE OF NEW JERSEY, 150 tons, highway bridge, to Bethlehem Steel Co.

BALTIMORE & OHIO RAILROAD, 1500 tons, bridges at Philadelphia, to Shoemaker Bridge Co.

NEW YORK CENTRAL RAILROAD, 750 tons, bridges in Indiana; 250 tons to Fort Pitt Bridge Works, and 500 tons to Bethlehem Steel Co.

BUFFALO, 500 tons, marine towers for Hecker-Jones-Jewell flour mill, to Kellogg Structural Steel Co.

CHICAGO, 8000 tons, Forman National Bank building, to Hansell-Elcock Co., local.

CHICAGO, MILWAUKEE & ST. PAUL RAILROAD, 250 tons, girder spans, to American Bridge Co.

LA CROSSE, WIS., 400 tons, highway bridge, to McClintic-Marshall Co.

CHIPPEWA FALLS, WIS., 400 tons, power house gates for Northern States Power Co., to Minneapolis Steel & Machinery Co.

COLUMBIA, MO., 100 tons, Columbia Theater, to St. Louis Structural Steel Co.

NILES FERRY, TENN., 300 tons, bridge for Tennessee Highway Commission, to St. Louis Structural Steel Co.

STATE OF TEXAS, 500 tons, highway bridge across Brazos River, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

BILLINGS, MONT., 300 tons, bridge over Snake River at Swan Valley, to unnamed fabricator.

LOS ANGELES, 1250 tons, Medical Building, to Union Iron Works.

OAKLAND, CAL., 350 tons, Women's Athletic Club, to Herrick Iron Works.

RICHMOND, CAL., 1000 tons, plates and shapes for two 80,000 and five 21,000-bbl. tanks for Petroleum Securities Co., to Western Pipe & Steel Co.

FRESNO, CAL., 2500 tons, building for Western Fruit Exchange Co., to Minneapolis Steel & Machinery Co.

STEGE, CAL., 110 tons, plant for Western Industries, Inc., to Jansen Iron Works.

OLYMPIA, WASH., 100 tons, bridge over Nooksack River, Whatcom County, to Wallace Bridge & Structural Steel Co.

PORT TOWNSEND, WASH., 250 tons of additional plates for pipe line, to Steel Tank & Pipe Co.

TACOMA, WASH., 1200 tons, for Pacific Bag & Paper Co., to United States Steel Products Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

PHILADELPHIA, 150 tons, bank and office building, Sixteenth and Locust Streets.

PHILADELPHIA, 250 tons, telephone building, Seventeenth and Tioga Streets.

PHILADELPHIA, 250 tons, Ninth Bank and Trust Co. building.

PHILADELPHIA, 150 tons, addition for West Philadelphia Title & Trust Co.

PHILADELPHIA, 500 tons, Northeastern Title & Trust Co. building; general contract to Frank G. Stewart, local.

BUFFALO, 200 tons, three Erie County bridges.

ERIE, PA., 600 tons, factory extension for J. A. Zurn Co.

CLEVELAND, 200 tons, laboratory for American Gas Association.

CLEVELAND, 100 tons, Kresge store building.

CLEVELAND, 200 tons, Steel Improvement & Forge Co., factory building.

LEXINGTON, KY., tonnage unstated, memorial building for University of Kentucky.

STATE OF NEW HAMPSHIRE, 1000 tons, highway bridges.

BOSTON, 150 tons, highway bridge for city.

NEW YORK, 700 tons, chapel for Fordham University.

EAST ORANGE, N. J., 200 tons, municipal building.

ALBANY, N. Y., 500 tons, garage.

ROCHESTER, N. Y., 175 tons, State Hospital.

GARY, IND., 700 tons, Lake County Court House.

CHICAGO, 4500 tons, Steuben Club.

CHICAGO, 2400 tons, office building at Jackson Boulevard and Franklin Street.

CHICAGO, 700 tons, Home Syndicate Garage.

PEKIN, ILL., 1700 tons, bridge across Illinois River.

BLOOMINGTON, IND., 700 tons, building for University of Indiana.

MILWAUKEE, 7000 tons, Sixteenth Street viaduct, with bascule span; bids close Feb. 10 on fabrication and delivery only; bids on erection later.

BOISE, IDAHO, 233 tons, bridge over Clark Fork River, Sanders County; bids in.

SAN FRANCISCO, 270 tons, apartment building, Pacific and Laguna Streets; bids being taken.

FABRICATED STEEL PLATES

Bookings 3 Per Cent Lower in 1927—Gains in Oil Storage Tanks Offset Elsewhere

WASHINGTON, Jan. 24.—Bookings of fabricated steel plates totaled 497,697 tons in 1927, representing 51.5 per cent of capacity, against 513,913 tons or 51.9 per cent in 1926, according to reports made to the Department of Commerce by 51 firms. Of the 1927 orders, 210,974 tons were for oil storage tanks, comparing with 175,367 tons in the preceding year; 26,364 tons for refinery materials and equipment, as against 36,829 tons; 42,905 tons for tank cars, as against 42,938 tons; 39,212 tons for gas holders, as compared with 47,524 tons; 6924 tons for blast furnaces, as against 14,406 tons; and 171,318 tons for stacks and miscellaneous purposes, as against 196,849 tons.

Bookings in December totaled 35,648 tons, or 44.1 per cent of capacity, comparing with 27,341 tons, or 33.8 per cent of capacity in November.

Shipments in December were 42,694 tons, as compared with 37,986 in November. Production in December amounted to 47,876 tons, against 40,845 tons in November. The December monthly capacity was 100,685 tons, with 47.6 per cent operated, as against 100,778 tons, or 40.5 per cent, operated in November.

December bookings were distributed as follows: Oil storage tanks, 13,367 tons; refinery materials and equipment, 1554 tons; tank cars, 3764 tons; gas holders, 3490 tons; blast furnaces, 385 tons; stacks and miscellaneous, 13,085 tons.

Plan World Congress of Engineers

More than 75 prominent engineers have accepted membership on the American committee of the World Congress of Engineers, to be held in Tokio, Japan, in November, 1929. Dr. Elmer A. Sperry, chairman of the division of engineering of the National Research Council, is chairman of the permanent committee and Secretary of Commerce Hoover is honorary chairman. Maurice Holland, secretary of the research council's division of engineering, is secretary of the American committee.

Advancement of international cooperation in the study of engineering science and problems, and stimulation of a sense of brotherhood among the engineers of the world are the announced purposes of the congress.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz and heavier	25.00c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.12½c.
Copper	26.00c.
Brazed Brass Tubes	26.75c.
Brass Rods	16.50c.

for zinc for delivery in March and April is brisk. The old metal market is dull and prices are weak.

Prices, per lb., in carload lots: Lake copper, 14.25c.; tin, 56.75c.; lead, 6.35c.; zinc, 5.70c.; in less-than-carload lots, antimony, 12.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.25c.; pewter, No. 1, 34c.; tin foil, 40c.; block tin, 50c.; aluminum, 12.50c.; all being dealers' prices for less-than-carload lots.

REINFORCING STEEL

Awards of 9500 Tons Include 8000 Tons For Plants in Chicago and Boston

Awards of more than 9500 tons included 5000 tons for the Boston-Cambridge, Mass., plants of Sears, Roebuck & Co. and 3000 tons for the Campbell Soup Co. plant in Chicago. New projects reported totaled only about 900 tons, less than any week since the first of the year. Included in new business was 400 tons for an apartment building in Chicago. Awards follow:

BOSTON-CAMBRIDGE, 5000 tons, Sears, Roebuck & Co. plants, to Concrete Steel Co.

PROVIDENCE, R. I., 125 tons, Court House, to Truscon Steel Co.

ROCHESTER, N. Y., 180 tons, State hospital, to unnamed local contractor.

PITTSBURGH, 360 tons, Grant Building; 160 tons to Truscon Steel Co., and 200 tons to Carlem Engineering Co.

CHICAGO, 3000 tons of rail steel bars, plant for Campbell Soup Co., to Calumet Steel Co.

MARSHALLTOWN, IOWA, 200 tons, hotel, to Concrete Engineering Co.

ST. LOUIS, 220 tons, apartment buildings, to Laclede Steel Co.

ORLAND, CAL., 326 tons, Stony Gorge dam; 281 tons to Pacific Coast Steel Co., and 45 tons to Laclede Steel Co.

SEATTLE, 100 tons, Bartell Drug Co., to Pacific Coast Steel Co.

SEATTLE, 110 tons, Queen Anne High School addition, to Pacific Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BUFFALO, 100 tons, seven County bridges; bids opened Feb. 7.

CHICAGO, 400 tons, apartment building at 222 Chestnut Avenue.

RIVERSIDE, CAL., 120 tons, Victoria Avenue bridge; bids opened.

SEATTLE, WASH., 2500 tons, Bon Marche department store; bids soon.

SEATTLE, 1000 tons, Weaver Street bridge; bids being taken.

SEATTLE, 1000 tons, Beacon Hill tunnel; bids being taken.

ELYRIA, OHIO, 300 tons, sewage disposal plant.

Total apparent consumption of babbitt metal in 1927 was 60,111,843 lb., as against 65,934,782 lb. in 1926, according to reports received by the Department of Commerce from 31 firms. Sales by manufacturers in 1927 amounted to 47,003,959 lb., and consumption by producers to 13,107,884 lb., comparing with 50,555,110 lb. and 15,379,672 lb. respectively in 1926. Total apparent consumption in December was 4,465,787 lb., compared with 4,505,954 lb. in November.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.00c.	13.50c.
Copper, heavy and wire	11.75c.	12.875c.
Copper, light and bottoms	9.75c.	11.00c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.75c.
No. 1 yellow brass turnings	7.75c.	8.75c.
No. 1 red brass or composition turnings	8.75c.	9.75c.
Lead, heavy	5.25c.	5.625c.
Lead, tea	4.25c.	4.75c.
Zinc	3.75c.	4.25c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.75c.	14.50c.

RAILROAD EQUIPMENT

Inquiries for About 500 Cars But Orders Are For Minor Lots

Although expectations are that railroad equipment buying will show a new spurt soon, the week's business amounted only to a few small purchases and inquiries for about 500 cars. Details follow:

Government of Siam has ordered eight locomotives from Baldwin Locomotive Works.

Wilson & Co., Chicago, have made inquiry for 300 40-ton refrigerator cars.

Northern Pacific has ordered 50 caboose car underframes from Siems-Stembel Co.

Western Lumber Co. has ordered one Prairie-type locomotive from Baldwin Locomotive Works.

Great Northern has placed an order for eight 30-cu. yd. air-dump cars with Koppel Industrial Car & Equipment Co.

Sloss-Sheffield Steel & Iron Co. has ordered one consolidation type locomotive from Baldwin Locomotive works.

Toronto, Hamilton & Buffalo has placed an order for two 2-8-4-type locomotives with Montreal works of American Locomotive Co.

Texas & Pacific has ordered two business cars from American Car & Foundry Co.

Southern Railway has ordered one baggage and mail car from Bethlehem Steel Co., in addition to 25 cars reported some time ago.

Standard Oil Co. of New Jersey is inquiring for 12 all-steel 50-ton box cars.

Republic Iron & Steel Co. is inquiring for 50 70-ton gondola car bodies.

Manila Railroad has ordered 50 flat cars from Gregg Co. and has made inquiry for 50 box cars.

Lake Superior & Ishpeming will buy 250 ore cars.

New York, Westchester & Boston Railway has ordered 10 additional electric passenger cars from Westinghouse Electric & Mfg. Co.

Universal Pipe & Radiator Co. Plans Expansion

The Universal Pipe & Radiator Co., 420 Lexington Avenue, New York, has proposed to its stockholders an increase in the authorized common stock of the company from 400,000 to 3,000,000 shares, for the reported purpose of acquiring additional properties. In a letter to the stockholders of the company calling a special meeting for Feb. 15, President Louis B. Ladoux said in part:

In connection with the rapid growth of the business of your company, the management has for the past few years pursued a policy of diversification with the idea of offsetting the seasonal fluctuations in the building and allied trades. In line with this policy, the business of the company has recently been extended to include through its subsidiaries, the manufacture of railroad brake shoes, the operation of by-product ovens and the manufacture of artificial stone for ornamental purposes. Plans for further expansion are being considered which, if consummated, would greatly strengthen your company.

The Universal Pipe & Radiator Co. was incorporated in 1923 to take over the properties of the Iron Products Corporation, the Central Foundry Co. and the Central Radiator Co. It is also the holding company of the Essex Foundry Co., Newark, N. J., the Molby Boiler Co., Lansdale, Pa., and the Chattanooga Iron & Coal Corporation, Chattanooga, Tenn.

FABRICATED STRUCTURAL STEEL

Cleveland Award of 57,800 Tons Brings Week's Total to 103,000 Tons

Marked by two structural steel awards of unusual size, 57,800 tons for the Cleveland Union Terminals, Cleveland, and 15,000 tons for a building in Boston, the week's total of fabricated steel contracts exceeded 103,000 tons. Other outstanding awards were 8000 tons for a bank building in Chicago and 7000 tons for subway work in New York. Awards follow:

ALLERTON, N. J., 350 tons, Packers' Island bridge for New Jersey State Highway Commission, to Phoenix Bridge Co.

PHILADELPHIA, 115 tons, Fern Rock Terminal for Department of City Transit, to Montgomery Iron & Steel Co.

CLEVELAND, 57,800 tons, railroad station, department store building, garage and Huron Road viaduct, as part of Cleveland Union Terminals project, to American Bridge Co.

BOSTON, 15,000 tons, New England Building, to McClintic-Marshall Co. and New England Structural Co.

NEW YORK, 900 tons, tunnel shields for Fulton Street tunnel, to Biggs Boiler Works Co., Akron, Ohio.

NEW YORK, 7000 tons, section 13, route 107 of subway, to McClintic-Marshall Co.

NEW YORK, 700 tons, apartment building on East Twenty-second Street, to Easton Structural Steel Co.

NEW YORK, 700 tons, apartment building on Forty-third Street, to Harris Structural Steel Co.

NEW YORK, 550 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: Office building at Franklin Avenue and Fifteenth Street, Flushing; apartment building on Scotland Road, East Orange, State Bank at Eighth Avenue and Forty-third Street and inclosures for sledge beds for Barnes Engineering Co. at Lodi, N. J., to Lehigh Structural Steel Co.

FLUSHING, N. Y., 200 tons, apartment building, to an unnamed fabricator.

STATE OF NEW JERSEY, 150 tons, highway bridge, to Bethlehem Steel Co.

BALTIMORE & OHIO RAILROAD, 1500 tons, bridges at Philadelphia, to Shoemaker Bridge Co.

NEW YORK CENTRAL RAILROAD, 750 tons, bridges in Indiana; 250 tons to Fort Pitt Bridge Works, and 500 tons to Bethlehem Steel Co.

BUFFALO, 500 tons, marine towers for Hecker-Jones-Jewell flour mill, to Kellogg Structural Steel Co.

CHICAGO, 8000 tons, Forman National Bank building, to Hansell-Elcock Co., local.

CHICAGO, MILWAUKEE & ST. PAUL RAILROAD, 250 tons, girder spans, to American Bridge Co.

LA CROSSE, WIS., 400 tons, highway bridge, to McClintic-Marshall Co.

CHIPPEWA FALLS, WIS., 400 tons, power house gates for Northern States Power Co., to Minneapolis Steel & Machinery Co.

COLUMBIA, MO:, 100 tons, Columbia Theater, to St. Louis Structural Steel Co.

NILES FERRY, TENN., 300 tons, bridge for Tennessee Highway Commission, to St. Louis Structural Steel Co.

STATE OF TEXAS, 500 tons, highway bridge across Brazos River, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

BILLINGS, MONT., 300 tons, bridge over Snake River at Swan Valley, to unnamed fabricator.

LOS ANGELES, 1250 tons, Medical Building, to Union Iron Works.

OAKLAND, CAL., 350 tons, Women's Athletic Club, to Herrick Iron Works.

RICHMOND, CAL., 1000 tons, plates and shapes for two 80,000 and five 21,000-bbl. tanks for Petroleum Securities Co., to Western Pipe & Steel Co.

FRESNO, CAL., 2500 tons, building for Western Fruit Exchange Co., to Minneapolis Steel & Machinery Co.

STEGE, CAL., 110 tons, plant for Western Industries, Inc., to Jansen Iron Works.

OLYMPIA, WASH., 100 tons, bridge over Nooksack River, Whatcom County, to Wallace Bridge & Structural Steel Co.

PORT TOWNSEND, WASH., 250 tons of additional plates for pipe line, to Steel Tank & Pipe Co.

TACOMA, WASH., 1200 tons, for Pacific Bag & Paper Co., to United States Steel Products Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

PHILADELPHIA, 150 tons, bank and office building, Sixteenth and Locust Streets.

PHILADELPHIA, 250 tons, telephone building, Seventeenth and Tioga Streets.

PHILADELPHIA, 250 tons, Ninth Bank and Trust Co. building.

PHILADELPHIA, 150 tons, addition for West Philadelphia Title & Trust Co.

PHILADELPHIA, 500 tons, Northeastern Title & Trust Co. building; general contract to Frank G. Stewart, local.

BUFFALO, 200 tons, three Erie County bridges.

ERIE, PA., 600 tons, factory extension for J. A. Zurn Co.

CLEVELAND, 200 tons, laboratory for American Gas Association.

CLEVELAND, 100 tons, Kresge store building.

CLEVELAND, 200 tons, Steel Improvement & Forge Co., factory building.

LEXINGTON, KY., tonnage unstated, memorial building for University of Kentucky.

STATE OF NEW HAMPSHIRE, 1000 tons, highway bridges.

BOSTON, 150 tons, highway bridge for city.

NEW YORK, 700 tons, chapel for Fordham University.

EAST ORANGE, N. J., 200 tons, municipal building.

ALBANY, N. Y., 500 tons, garage.

ROCHESTER, N. Y., 175 tons, State Hospital.

GARY, IND., 700 tons, Lake County Court House.

CHICAGO, 4500 tons, Steuben Club.

CHICAGO, 2400 tons, office building at Jackson Boulevard and Franklin Street.

CHICAGO, 700 tons, Home Syndicate Garage.

PEKIN, ILL., 1700 tons, bridge across Illinois River.

BLOOMINGTON, IND., 700 tons, building for University of Indiana.

MILWAUKEE, 7000 tons, Sixteenth Street viaduct, with bascule span; bids close Feb. 10 on fabrication and delivery only; bids on erection later.

BOISE, IDAHO, 233 tons, bridge over Clark Fork River, Sanders County; bids in.

SAN FRANCISCO, 270 tons, apartment building, Pacific and Laguna Streets; bids being taken.

FABRICATED STEEL PLATES

Bookings 3 Per Cent Lower in 1927—Gains in Oil Storage Tanks Offset Elsewhere

WASHINGTON, Jan. 24.—Bookings of fabricated steel plates totaled 497,697 tons in 1927, representing 51.5 per cent of capacity, against 513,913 tons or 51.9 per cent in 1926, according to reports made to the Department of Commerce by 51 firms. Of the 1927 orders, 210,974 tons were for oil storage tanks, comparing with 175,367 tons in the preceding year; 26,364 tons for refinery materials and equipment, as against 36,829 tons; 42,905 tons for tank cars, as against 42,938 tons; 39,212 tons for gas holders, as compared with 47,524 tons; 6924 tons for blast furnaces, as against 14,406 tons; and 171,318 tons for stacks and miscellaneous purposes, as against 196,849 tons.

Bookings in December totaled 35,648 tons, or 44.1 per cent of capacity, comparing with 27,341 tons, or 33.8 per cent of capacity in November.

Shipments in December were 42,694 tons, as compared with 37,986 in November. Production in December amounted to 47,876 tons, against 40,845 tons in November. The December monthly capacity was 100,685 tons, with 47.6 per cent operated, as against 100,778 tons, or 40.5 per cent, operated in November.

December bookings were distributed as follows: Oil storage tanks, 13,367 tons; refinery materials and equipment, 1554 tons; tank cars, 3764 tons; gas holders, 3490 tons; blast furnaces, 385 tons; stacks and miscellaneous, 13,085 tons.

Plan World Congress of Engineers

More than 75 prominent engineers have accepted membership on the American committee of the World Congress of Engineers, to be held in Tokio, Japan, in November, 1929. Dr. Elmer A. Sperry, chairman of the division of engineering of the National Research Council, is chairman of the permanent committee and Secretary of Commerce Hoover is honorary chairman. Maurice Holland, secretary of the research council's division of engineering, is secretary of the American committee.

Advancement of international cooperation in the study of engineering science and problems, and stimulation of a sense of brotherhood among the engineers of the world are the announced purposes of the congress.

PERSONAL

Charles E. Stuart has resigned as president, treasurer and a director of the Central Alloy Steel Corporation, Massillon, Ohio, and has been succeeded by B. F. Fairless, formerly vice-president and general manager. S. S. French has been elected a director to succeed Mr. Stuart on the board and will become vice-president and treasurer. Mr. French will continue as president of the Berger Mfg. Co. division of the corporation. Mr. Stuart was one of the two organizers of the Central Steel Co., Massillon, Ohio, in 1914, and became its secretary and treasurer. Later he was made vice-president and in 1926 succeeded F. J. Griffith as president, the latter becoming chairman of the board. When the Central Steel Co. and the United Alloy Steel Corporation were merged later in the same year as the Central Alloy Steel Corporation, Messrs. Stuart and Griffith retained the same official positions with the new organization that they had held with the Central Steel Co. Mr. Fairless, after his graduation at Ohio State University, taught school for a time and went with the Central Steel Co. at the time of its organization, as a civil engineer. He worked his way up to the position of vice-president and general manager. After the merger he became vice-president and general manager of the new corporation and in the latter capacity had charge of operations of both the Massillon and Canton plants. He will continue as general manager of the company.

B. F. FAIRLESS

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Laurence Thompson has resigned as Cleveland district manager of the United States Electrical Tool Co., Cincinnati, to become Cleveland district engineer for the New Haven Sand Blast Co., New Haven, Conn. After Feb. 1 he will be located at 355 Erie Building.

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C. E. Stuart, who resigned recently as president of the Central Alloy Steel Corporation, Massillon, Ohio, and W. H. Crawford, secretary of the Reliance Mfg. Co., Massillon, sailed from New York Jan. 25 for an extended Mediterranean cruise.

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Milton H. Pettit, vice-president Nash Motors Co., Kenosha, Wis., has been appointed general manager of the company. He joined the Nash organization as a vice-president in charge of plants and production, July 1, 1926, having previously served in the same capacity with the Simmons Co., Kenosha.

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John A. Coe, president of the American Brass Co., Waterbury, Conn., has been made president of the Waterbury Savings Bank to succeed the late Robert F. Griggs.

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Robert W. Adams, manager of the Providence, R. I., office of the General Electric Co., was the speaker last week before the Worcester, Mass., section of the American Institute of Electrical Engineers.

—

Thornton E. Stokes, for the past two years Southern sales manager of the Lawrenceburg Roller Mills Co., Lawrenceburg, Ind., has been made sales promotion manager for the Continental Steel Corporation, Kokomo, Ind.

—

Earl A. Emerson, vice-president of the Armco International Corporation, Middletown, Ohio, has been elected president of the Foreign Trade Association of the Cincinnati Chamber of Commerce. He succeeds Charles D. Oesterlein, vice-president and general manager of the Oesterlein Machine Co., who becomes a member of the board of directors. The association also elected H. G. Moebus, export manager of the Andrews Steel Co., as vice-president, and Robert S. Alter, vice-president of the American Tool Works Co., as a member of the board of directors.

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R. C. Storch, traffic manager of the R. K. LeBlond Machine Tool Co., Cincinnati, has been elected secretary and treasurer of the newly organized Greater Cincinnati Freight Association.

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Howard W. Edwards, treasurer of the Edwards Mfg. Co., Cincinnati, maker of sheet metal products, has been named second vice-president of the Cincinnati Chamber of Commerce.

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William Reis has been appointed purchasing agent of the R. K. LeBlond Machine Tool Co., Cincinnati, succeeding the late F. W. Weimann. Mr. Reis has been associated with the purchasing department of the company for a number of years.

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William C. Oberg, for the past nine years superintendent of the roll department, Homestead works, Carnegie Steel Co., has been appointed to a newly created position of superintendent of roll departments, with jurisdiction over the roll shops in the several plants of the company. Mr. Oberg will make his headquarters at the company's general offices in Pittsburgh. He was a roll designer at the Homestead works before his promotion to the superintendency of the shop, and joined the Carnegie company after having been with the Pittsburgh Rolls Corporation for several years.

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Philip E. Bliss, since 1923 vice-president of the Warner & Swasey Co., manufacturer of turret lathes and screw machines, Cleveland, has been elected president, succeeding Col. Frank A. Scott, who has been made chairman of the board. Ambrose Swasey and Worcester R. Warner have alternated as chairman for a number of years and will continue to participate actively in the company's management as directors. They recently passed their eighty-first birthdays. Mr. Bliss has been associated with the company for 18 years and has served in practically all of its departments. He was cashier and later auditor, and in 1917 was made treasurer, holding that position until he became executive vice-president in 1923. He was born in Cleveland in 1885 and attended Ohio Wesleyan University, Delaware, Ohio. He has taken an active interest in the National Machine Tool Builders' Association, and last September was elected its president. He is a member of the Society of Automotive Engineers and of the Cleveland Engineering Society.

PHILIP E. BLISS

—

C. E. Luttrell, for five years manager of the Knight-Luttrell Iron Co., Atlanta, Ga., has been placed in charge of the iron and steel department of Thomas F. Seitzinger's Sons, Atlanta, dealers in iron, steel and metals.

—

H. C. Atkins, president E. C. Atkins & Co., saw manufacturers, Indianapolis, and other officials of the company entertained the Atkins Pioneers, an organization of old-time employees of the company, at dinner at the Hotel Severin, Indianapolis, Saturday night, Jan. 14. The Atkins Pioneers was organized in 1906, with 62 charter members who had served the company 20 years or more, and it now has 228 male members and a women's auxiliary consisting of 18 members who have

served 10 years or more. At the dinner there were talks by H. C. Atkins, who is honorary president of the Atkins Pioneers, and by William J. Strack and C. A. Newport, president and secretary respectively of the Pioneers, and also by W. A. Atkins, general factory director of E. C. Atkins & Co.

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Harold E. Boyd has resigned as employment manager of the Republic Metalware Co., Buffalo, and as lecturer in industrial management in the evening session of the University of Buffalo, to become industrial engineer with the Nashua Gummed & Coated Paper Co., Nashua, N. H. During his 11 years with the Republic company, Mr. Boyd held the positions of time study man, head time study man, educational supervisor, efficiency engineer, assistant to general manager and office manager.

—

Victor Windett, newly appointed manager of the gas producer division of the Wellman-Seaver-Morgan Co., Cleveland, as announced in THE IRON AGE last week, has been engineer of that division since 1917. He is a graduate in mechanical engineering of the Massachusetts Institute of Technology. Following his college course, he was connected with the Illinois Steel Co., Chicago, in operating and engineering work and designed and supervised the construction of that company's ore docks. As Chicago representative of Julian Kennedy, blast furnace engineer, he superintended the building of the Lake Shore plant of the Iroquois Iron Co. Later he was resident engineer of the American Coke & Gas Construction Co. in the building of the Otto Hoffman coke oven plant at Mayville, Wis., for the Northwestern Iron Co. He spent some time as engineer and contractor at New Orleans and in other points in Louisiana on drainage, water, sewerage and levee construction work, in the Chicago district on various public work, including harbor and bridge work, and on the United States locks at Sault Ste. Marie, Mich. During the World War he supervised the building of open-hearth furnaces at the Watertown, Mass., arsenal for the Wellman-Seaver-Morgan Co. and of sulphuric acid plants at Cuba City and at New Diggings, Wis., for the Leonard Construction Co., Chicago.

VICTOR WINDETT

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W. B. Speirs, formerly associated with the Delaware, Lackawanna & Western Railroad in various capacities, has been appointed district manager of the Newark, N. J., office of the Elwell-Parker Electric Co., Cleveland. He succeeds D. D. Ritson. The company's Newark office is in the Military Park Building.

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Ires Prosser has been appointed Southeastern representative of the Botfield Refractories Co., Philadelphia. His territory will extend from North Carolina to San Antonio, Tex., and his headquarters will be at Atlanta, Ga.

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E. R. Goldapp, associated for 12 years with the Portland Wire & Iron Works, Portland, Ore., has been made manager of the company. He takes over the duties of T. Harry Banfield, who has succeeded the late C. J. Parker in the management of the Parker-Banfield Co., owner of the Portland Wire & Iron Works. Before becoming associated with the latter company, Mr. Goldapp was identified with the Portland Sheet Metal Works, Portland.

—

J. B. Cooper, formerly in the Los Angeles office of the Allis-Chalmers Mfg. Co., Milwaukee, has been placed in charge of a new district sales office opened by the company at 308 Heard Building, Phoenix, Ariz. His territory will include Arizona, New Mexico and northern Mexico. The company also has opened a branch office at 619 Frost National Bank Building, San Antonio, Tex., in charge of Earle R. Hury. G. C. Culver is manager of another new office at Grand Rapids, Mich.

—

Daniel W. Northup, president Henry G. Thompson & Son Co., New Haven, Conn., has been elected president of the recently organized Hack Saw Manufacturers' Association of America. The association is now working, under the auspices of the Department of Commerce, for the improvement of conditions in the industry.

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Dr. Thomas Stockham Baker, president Carnegie Institute of Technology, Pittsburgh, will spend six weeks in Europe during February and March in the interests of the organization of the second International Conference on Bituminous Coal, to be held at Pittsburgh the week of Nov. 29.

—

Charles Pasche, secretary and treasurer Davenport Locomotive & Mfg. Corporation, Davenport, Iowa, has been elected president of the company, succeeding E. Parmly, Jr., and will also continue as its treasurer. Mr. Pasche has been associated with the company since 1901.

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Frank W. Gorman, formerly with the Mine & Smelter Supply Co., El Paso, Tex., has been appointed district sales representative at El Paso for the Ohio Brass Co., Mansfield, Ohio. He succeeds L. M. Keating, who has been transferred to the general sales department at Mansfield.

—

Joseph H. Donberg, recently with Louis E. Emerson & Co., Chicago, machinery dealers, has organized his own company under the name of Joseph H. Donberg & Co., with temporary quarters at 1426 South Harding Avenue, Chicago. The company will deal in new and used machine tools and equipment.

—

C. M. MacChesney has been elected secretary of the Acme Steel Co., Chicago, succeeding Donald MacMurray, who was vice-president and secretary. Mr. MacMurray remains vice-president. L. H. Whiting has been elected a director of the company, succeeding H. G. Merrill, resigned.

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Myron C. Taylor, chairman of the finance committee of the United States Steel Corporation, has been elected vice-president of the New York Genealogical and Biographical Society to take the place of the late Elbert H. Gary, who held the position for many years.

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Dr. W. R. Ingalls, director of the American Bureau of Metal Statistics, 115 Broadway, New York, sailed recently for Europe on a professional trip. He will return about April 1.

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E. H. Wachs, since 1911 secretary of the Stocker-Rumely-Wachs Co., 117 North Jefferson Street, Chicago, dealer in machine tools, and C. R. Gregg, until recently in charge of machinery sales in the Chicago district for Joseph T. Ryerson & Son, Inc., are now managing the Stocker-Rumely-Wachs Co.

—

William Butterworth, president Deere & Co., Moline, Ill., who left this week for a trip to the Hawaiian Islands, will be speaker at a meeting of the Western division of the Chamber of Commerce of the United States in Honolulu. Mr. Butterworth is vice-president of the United States Chamber.

Total exports from the United States in 1927 were valued at $4,866,160,000 and imports at $4,184,453,000, according to the Department of Commerce. Exports were higher and imports lower than in 1926.

OBITUARY

EDWARD LARNED RYERSON, chairman of the board of Joseph T. Ryerson & Son, Inc., Chicago, died on Jan. 19 at his home in that city. Death followed a stroke of apoplexy which he suffered on Jan. 14. He was the youngest son of Joseph Turner Ryerson, founder of the firm which bears that name, and was born in Chicago Nov. 24, 1854. After graduation in 1876 from the Sheffield Scientific School of Yale University, he entered his father's business and two years later was made a partner in the firm. At that time the company name was changed to Joseph T. Ryerson & Son. The younger Mr. Ryerson succeeded his father in the management of the business upon the death of the latter in 1883, and when the company was incorporated in 1888 he became president. In 1911 he retired from the presidency to become chairman of the board. Throughout an active life in the business world Mr. Ryerson maintained contacts with the civic and cultural life of his city and was a member of many associations and clubs. He was a director and member of the executive committee of the Illinois Merchants' Trust Co., Chicago, and was at one time a trustee of the Chicago Commons Association. He was a trustee and for a number of years vice-president of St. Luke's Hospital, and was one of the founders and honorary president of the Foundation for Architecture and Landscape Architecture of Lake Forest, Ill., which provides professional education to promising youths. He was a member of the Chicago Art Institute and a vice-president of the American Institute of Graphic Arts. He was a governing member of the Chicago Symphony Orchestra, a trustee of the Chicago Historical Society and since 1914 had been president of the Newberry Library, Chicago. Mr. Ryerson is survived by his widow, three sons and one daughter. The sons, Joseph T., Donald M. and Edward L., Jr., are president, vice-president and general manager and vice-president respectively of the Ryerson company.

EDWARD L. RYERSON

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THOMAS ARTHUR JONES, president and general manager of the Sackett Screen & Chute Co., Chicago, and vice-president of the W. A. Jones Foundry & Machine Co., Chicago, died on Jan. 19 at his home in River Forest, Ill. He was born Dec. 12, 1864, in Susquehanna County, Pennsylvania, and there attended the public schools and Wyoming Seminary. He went to Chicago in 1892 and became associated with the W. A. Jones company. He served as secretary for many years and later was president. In 1918 he took over the active management of the Sackett Screen & Chute Co., conducting this business until his death.

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FRANK BILLINGS, for 30 years prominently identified with the iron ore industry in Cleveland as president of the Tod-Stambaugh Co., died suddenly at his home in that city Jan. 19, aged 74 years. He attended the public schools of Chicago and the University of Chicago, having moved to that city from Hastings-on-the-Hudson, N. Y., where he was born. Later he went to Cleveland, and in 1894 he became president of the Tod-Stambaugh Co., remaining at the head of that company until Jan. 1, 1925, when its ownership passed to the M. A. Hanna Co. His associate in the Tod-Stambaugh Co. was Col. Carmi A. Thompson, who was vice-president and general manager. Mr. Billings was a director of the Union Trust Co. and the Guardian Trust Co., Cleveland, and was connected with various industrial corporations.

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HARVEY MUNDIE, secretary-treasurer of the Mundie Foundry & Machinery Co., Peru, Ill., died Jan. 6 as a result of an automobile accident.

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FREDERICK W. SUMNER, president of the Sumner Iron Works, Everett, Wash., died recently at his home in that city, aged 77 years. He was a native of Wisconsin and went to Everett in 1893, where he established the Sumner Iron Works.

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CHARLES C. ROUNDY, president of the Sargent, Osgood & Roundy Co., Randolph, Vt., and well known in the agricultural implement industry of New England, died Jan. 19 at his home in Worcester, Mass. He was born at Springfield, Vt., 65 years ago.

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JAMES W. CORRIGAN, president Corrigan, McKinney Steel Co., Cleveland, died suddenly Jan. 24 of heart failure at the age of 47. He had been head of the company since early in 1925, when he acquired a minority interest which, added to his large stock holdings, enabled him to wrest control of the company from the late Price McKinney. Shortly afterward the name was changed from the McKinney Steel Co. to the present name. Mr. Corrigan had been vice-president of the McKinney Steel Co., which was the successor of Corrigan, McKinney & Co., of which his father, the late James C. Corrigan, was one of the founders, but he did not take an active part in the business until he acquired control. Since he became president he had given close attention to the company's affairs.

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CHARLES LEON SNOW, who was treasurer of the Air Reduction Co., Inc., 342 Madison Avenue, New York, until his retirement last year, died at his home in New York on Jan. 6. He was born at Portland, Me., in 1875, and attended the Portland high school and Dartmouth College, having been graduated from the latter institution in 1898. He became associated with the New York office of the Western Electric Co., remaining with that company until 1913, when he became general auditor in charge of the Minneapolis division of the Interstate Co. His connection with the Air Reduction company dated from 1916 and in 1920 he was made treasurer, holding the latter position until his retirement on account of failing health.

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WILLIAM PARKER WARD, mining engineer and a pioneer in the production of ferromanganese in the United States, died on Jan. 17 at his home in Savannah, Ga., aged 83 years.

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WILLIAM J. HENRY, president Oswego Tool Works, Oswego, N. Y., and of the Henry Forge & Tool Co., and the Crouse-Pope Foundry Co., both of Auburn, N. Y., died in the Auburn City Hospital on Jan. 18, following an operation. For a number of years he was president of the Henry & Allen Mfg. Co., but sold his interests in that concern some 10 years ago and organized the two Auburn companies in which he was active until his death. In 1927 he secured a controlling interest in the Oswego Tool Works, a concern for which his Auburn plants had made forgings for many years.

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ROBERT BENTLEY, president Ohio Iron & Steel Co., Lowellville, Ohio, and a director of the Youngstown Sheet & Tube Co., Youngstown, died at his home in the latter city on Jan. 21. He was born at Youngstown on Aug. 30, 1854, and after attending the public schools in that city he entered the employ of the First National Bank. He organized the Ohio Iron & Steel Co. in 1879 and was actively associated with it until his death. He was also prominently identified with many other financial and industrial organizations in the Mahoning Valley.

STEEL TREATERS' PROGRAM

Technical Papers Scheduled for First Semi-Annual Meeting to Be Held at Montreal Feb. 16-17

FIFTEEN technical papers have been obtained for the first semi-annual meeting of the American Society for Steel Treating to be held at the Mount Royal Hotel, Montreal, Canada, Feb. 16 and 17. The program is as follows:

Thursday, Feb. 16.

Morning Session: Alfred Stansfield, chairman.

"A Development of the Structure of the Micro Constitutents of Metals," by R. G. Guthrie, Peoples Gas Light & Coke Co., Chicago.

"Medium Carbon Pearlitic Manganese Steel," by Jerome Strauss, United States Navy Yard, Washington.

"Steels for Case Nitrification," by A. B. Kinzel, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

Afternoon Session: R. M. Bird, chairman.

"The Manufacture of Stainless Steel Castings in the Various Industries," by V. T. Malcolm, Chapman Valve Mfg. Co., Indian Orchard, Mass., and V. O. Homerberg, Massachusetts Institute of Technology, Cambridge.

"X-Rays and the Constituents of Stainless Steel," by E. C. Bain, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

"Hardness Testing," by H. M. German, Universal Steel Co., Bridgeville, Pa.

Evening Session.

"Heat Treatment of Forgings and Castings for Selective Directional Adjustment of Residual Stresses," by W. J. Merten, Westinghouse Electric & Mfg. Co., East Pittsburgh.

"The Modern Trend in Metallurgy," by Dr. F. C. Langenberg, Climax Molybdenum Co., New York.

Friday, Feb. 17.

Morning Session: Dr. J. A. Mathews, chairman.

"Effects of Antimony, Arsenic, Copper and Tin in High-Speed Tool Steel," by H. J. French and T. G. Digges, Bureau of Standards, Washington.

"Some General Thoughts on Fusion Welding," by S. W. Miller, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

"Types of Failure of Steel," by Robert Job, Milton Hersey Co., Ltd., Montreal.

"Some Failures of Locomotive Parts and Study of Same under the Microscope," by F. H. Williams, Canadian National Railways, Montreal.

Evening Session: E. F. Cone, chairman.

"Alloy Steel for Boilers," by Charles McKnight, International Nickel Co., New York.

"The Effect of Heat Treatment on the Properties of Chromium-Molybdenum Sheet Steel," by F. T. Sisco and D. M. Warner, Wright Field, Dayton, Ohio.

"A Note on the Hardness and Impact Resistance of Chromium-Nickel Steel," by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J.

Previous to the technical sessions, there will be the usual meeting of the board of directors on Wednesday, Feb. 15, as well as sessions of the recommended practice committee and the publication committee. The early bird's dinner is, as usual, scheduled for Wednesday evening followed by the choice of a theater or a tobogganing party. Several plants are to open their doors for visitations on Friday afternoon, Feb. 17.

Foundry Conference To Be Held by University of Wisconsin

A second annual foundry conference has been arranged by the department of mining and metallurgy of the college of engineering and the university extension division of the University of Wisconsin, Madison, Wis., for Jan. 31, Feb. 1, 2 and 3. It is to be held in the laboratories of the department of mining and metallurgy. Organized especially for foundry superintendents, managers, foremen, chemists, metallurgists and others interested in foundry problems, it will follow the plan of the first conference held last February. The round table method of presenting the subject matter will be used, and a group leader will lead the discussion. Some of the topics to be taken up are cupola practice, sand conditioning, malleable and steel castings, ferrous and non-ferrous metallography with laboratory work, the heat treatment of steel, cost accounting, routing and planning, brass and bronze castings, and aluminum and light metal castings.

Testing Society's Group Meetings at Washington March 20-23

Plans are being made by the American Society for Testing Materials to hold the usual spring group meeting of committees at Washington, from Tuesday, March 20, to Friday, March 23. With the meetings starting on Tuesday it will be possible to schedule the sessions of the metals and non-metals committees during the same week, a plan that has worked out successfully in recent years at similar meetings at Cleveland, Providence and Philadelphia.

Coming Meetings of Institute of Metals

The annual general meeting of the Institute of Metals (British) will be held in London on March 7 and 8, and the autumn meeting in Liverpool, Sept. 4 to 7.

During the past year the membership of the institute increased from 1801 to 1903. It is anticipated by the council that the present year, the twentieth of the institute's existence, will witness the enrollment of the two thousandth member.

The Quad-City Foundrymen's Association met Jan. 23 at the Davenport Chamber of Commerce, Davenport, Iowa, to discuss apprenticeship.

Foundrymen to Organize Research for Gray Iron Industry

In consideration of a proposed organization devoted to cast iron research for the betterment of the product of gray iron foundries, the board of directors of the Philadelphia Foundrymen's Association at its last meeting named a cast iron research committee and instructed this committee to take the necessary steps to assure the holding of a meeting for the discussion of this subject. B. H. Johnson, Cresson-Morris Co., Philadelphia, chairman of committee, has sent a notice to all the foundry associations of the country asking them to send a delegate to attend a meeting in Philadelphia on Tuesday, March 13, as the guest of the Philadelphia Foundrymen's Association, to discuss any research activity that may benefit the gray iron industry and to determine a method of procedure.

COMING MEETINGS

February

American Ceramic Society. Feb. 5 to 11. Thirtieth annual meeting held concurrently with meeting of National Brick Manufacturers Association, Hotel Ambassador, Atlantic City, N. J. Ross C. Purdy, 2525 North High Street, Columbus, Ohio, secretary.

Foundry Equipment Manufacturers' Association. Feb. 7. Annual meeting, Hotel Cleveland, Cleveland. H. Cole Estep, Penton Publishing Co., Cleveland, secretary.

Midwest Power Conference and Chicago Power Show. Feb. 14 to 17. Hotel Stevens, and exhibition at Coliseum, Chicago. George F. Pfisterer, secretary.

American Society for Steel Treating. Feb. 16 and 17. Semi-annual meeting, Mount Royal Hotel, Montreal, Canada. W. H. Eisenman, 7016 Euclid Avenue, Cleveland, secretary.

American Institute of Mining and Metallurgical Engineers. Feb. 20 to 23. Institute of Metals Division, Engineering Societies Building, New York. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

European Markets Continue Quiet

Inquiry Active in Many Lines, but Orders Slow—Poland Has All Its Blast Furnaces Operating

(*By Cable*)

LONDON, ENGLAND, Jan. 23.

PIG iron is quiet, but inquiry is improving and Cleveland foundry and forge producers are anticipating improved business soon. Hematite stocks are heavy and prices have weakened. Foreign ore is dull.

Finished iron and steel are quiet generally, especially the plate market, but there is a fair demand for light material and structural and engineering steel for domestic use. Mills rolling plates and shapes are seeking to meet competition in export markets and are reported to be devising a plan of selling below cost, receiving compensation from a fund to be levied on domestic production. Confirmation, however, is lacking and full details are not yet available.

Tin plate business is quiet, but inquiries are fair. Most sellers are asking up to 18s. 3d. ($4.45) per base box, f.o.b. works port, for forward shipment. Buyers, however, expect to purchase at about the official minimum of 17s. 9d. ($4.33) per base box, f.o.b. works port.

Galvanized sheets are quiet, but inquiry is improving and most makers have agreed on a minimum price of £13 per ton (2.82c. per lb.) for No. 24 gage corrugated sheets in bundles. Black sheets are dull and unchanged.

Overseas demand for Continental iron and steel has increased, particularly for bars, which are firmer in tone, but British exporters are quiet and have but little moving. In semi-finished material, Continental mills are reported to be well sold.

In Poland all 18 blast furnaces in the country were operating at the end of the year. The Polish Government is considering erection of a large shipyard near Danzig. Belgian mills have been awarded 2000 tons of rails for Sweden by the European Rail Makers' Association.

The German steel ingot output in December was 1,368,000 tons, bringing the year's production to 16,305,000 tons. Friedrich Krupp A. G. and Otto Wolff & Co. combined are negotiating with Rumania for deliveries of railroad material totaling £2,000,000.

British Market Inactive—Pig Iron Depressed

LONDON, ENGLAND, Jan. 6.—Recovery from the holiday period is still awaited by iron and steel producers. Sentiment in all markets is much improved, although the problem of meeting the competition of Continental producers is still unsolved. As an example of the seriousness of foreign competition in the British domestic market, total exports of Cleveland iron in 1927 were 250,000 tons, although prices declined a total of £1 ($4.87) per ton during the year, while imports of pig iron for the 12 months totaled 570,000 tons. At present there are only 40 furnaces in blast on the Northeast coast, and of the 31 furnaces in blast at the year's end in Scotland 9 have been blown out. In a normal pre-war year the average operation in Scotland was about 85 furnaces.

There has been a slight improvement in the volume of inquiry for finished products in the past few days, but export business is slack, particularly in heavy material. The capacity of plate mills is still greatly in excess of normal demand, and a considerable tonnage of foreign plates continues to be received by consumers. Mills producing lighter materials are fairly well engaged, and structural steel fabricators are active.

British shipbuilding in 1927 is estimated at 1,300,000 tons, about double the tonnage of the previous year, when the coal strike was in progress. In 1925 the total was 1,084,000 tons, and in 1924, 1,439,885 tons. Included in the production of last year was a large floating dock for the Singapore naval base.

Luxemburg Prices Firm with Market Quiet

LUXEMBURG, Jan. 4.—The improvement in business which began in October of last year reached a climax in the rather heavy purchasing in December occasioned by the threat of a suspension of German steel production because of the proposed enforcement of the

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	17½s.				$4.27		
Bilbao Rubio ore*..	1	0½	to £1	1s.		4.99	to	$5.11
Cleveland No. 1 fdy.	3	7½				16.44		
Cleveland No. 3 fdy.	3	5				15.83		
Cleveland No. 4 fdy.	3	4				15.59		
Cleveland No. 4 forge	3	3½				15.46		
Cleveland basic (nom.)	3	15	to	3	15½	18.27	to	18.39
East Coast mixed...	3	8	to	3	10	16.56	to	17.05
East Coast hematite	3	8½	to	3	10½	16.68	to	17.17
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to	38.96
Billets	6	0	to	6	10	29.22	to	31.66
Ferromanganese ...	13	10				65.75		
Ferromanganese (export)	13	0	to	13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.18	to	28.01
Tin plate, base box.	0	18	to	0	18¼	4.39	to	4.45
Black sheets, Japanese specifications.	13	5	to	13	10	64.53	to	65.75
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	5	to	10	10	2.23	to	2.28
Galv. sheets, 24 gage	13	0	to	13	5	2.82	to	2.88
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	1s.	to	£3	2s.	$14.85	to	$15.10
France	3	1	to	3	2	14.85	to	15.10
Luxemburg	3	1	to	3	2	14.85	to	15.10
Basic pig iron (nom.):								
Belgium	2	18	to	2	19	14.13	to	14.38
France	2	18	to	2	19	14.13	to	14.38
Luxemburg	2	18	to	2	19	14.13	to	14.38
Coke	0	18				4.39		
Billets:								
Belgium	4	7	to	4	7½	21.19	to	21.31
France	4	7	to	4	7½	21.19	to	21.31
Merchant bars:						C. per Lb.		
Belgium	4	18	to	4	19	1.08	to	1.09
France	4	18	to	4	19	1.08	to	1.09
Luxemburg	4	18	to	4	19	1.08	to	1.09
Joists (beams):								
Belgium	4	8	to	4	10	0.97	to	0.99
France	4	8	to	4	10	0.97	to	0.99
Luxemburg	4	8	to	4	10	0.97	to	0.99
Angles:								
Belgium	4	17½				1.08		
⅛-in. plates:								
Belgium (a)	6	4	to	6	5	1.37	to	1.38
Germany (a)	6	4	to	6	5	1.37	to	1.38
⅞-in. ship plates:								
Belgium	5	19	to	6	0	1.32	to	1.33
Luxemburg	5	19	to	6	0	1.32	to	1.33
Sheets, heavy:								
Belgium	6	1				1.34		
Germany	6	1				1.34		

(a) Nominal.

8-hr. day in rolling mills. With this threat removed, the steel market gradually became quiet. Mills have a good tonnage of business on their books and consequently are maintaining prices.

Semi-finished material continues quiet, with the market at £4 7s. to £4 9s. 6d. ($21.19 to $21.80) per ton, f.o.b. Antwerp. Beams are at the same level, and bars range from £4 17s. to £4 18s. per ton (1.08c. to 1.09c. per lb.), f.o.b. Antwerp. Severe competition from German and Dutch sellers of sheets has caused a slight decline in prices, particularly on the heavy gages.

Production of pig iron in November, 1927, was 221,217 metric tons, with 39 out of 47 furnaces in blast. Steel ingot output was 207,402 tons.

BELGIAN PRICES WEAKER

Mills Offer Concessions and Better Deliveries—German Competition Increases

ANTWERP, BELGIUM, Jan. 7.—The market is quiet and prices are unchanged, although slightly weaker. Export business is rather inactive, and mills are beginning to show more interest in securing additional tonnage, offering earlier deliveries and occasionally shading prices. In general, however, producers are fairly well booked as a result of the heavy purchasing at the end of the year.

A feature of the present market is the reappearance of German mills as serious competitors for a share of export trade. The prospect of intensified competition for foreign business has apparently caused some consumers to refrain from buying in expectation of still lower prices.

Pig Iron.—Domestic buying has been light, but prices are well maintained as a result of the limited tonnage available from the furnace syndicate. Export business continues quiet, with quotations on foundry iron ranging from £3 to £3 2s. ($14.61 to $15.10) per metric ton, f.o.b. Antwerp. This price is apparently too high to interest foreign users, so that sales are restricted. Bessemer iron, with sulphur at 0.08 per cent is quoted at £2 17s. to £2 19s. ($13.89 to $14.38) per metric ton, f.o.b. Antwerp.

Semi-Finished Material.—The lack of any sizable purchasing of billets or blooms renders determination of prices difficult. With practically no activity in billets, prices are nominally £4 6s. 6d. to £4 7s. 6d. ($21.07 to $21.31) per metric ton, f.o.b. Antwerp. Blooms are also quiet, with the market about £3 18s. ($19) per ton for 6-in. and larger to £4 2s. ($19.97) per ton for 4-in. blooms. Sheet bars are quite active, and, with mills well booked, the market ranges from £4 8s. to £4 9s. ($21.43 to $21.68) per ton, Antwerp.

Finished Material.—Small purchases of steel bars are bringing £4 17s. 6d. to £4 18s. 6d. per ton (1.08c. to 1.09c. per lb.), f.o.b. Antwerp. Desirable business, however, could probably be closed at 1s. (24c.) per ton less. Beam prices are maintained at £4 7s. to £4 9s. per ton (0.96c. to 0.98c. per lb.), f.o.b. Antwerp. The hoop market is fairly active, with hot-rolled material quoted at £5 17s. 6d. per ton (1.29c. per lb.), f.o.b. Antwerp. Wire rods are quoted at £5 10s. per metric ton (1.21c. per lb.), f.o.b. Antwerp. Sheet prices show less strength, particularly on the heavy gages, large tonnages of which have been offered by German mills.

Stainless Steel Containers Adopted in Germany

HAMBURG, GERMANY, Jan. 7.—Recent tests by breweries are said to show that containers made of Krupp stainless steel "V2A" do not affect the quality of beer. Several large breweries are preparing to use large stainless steel containers in making export shipments. The containers are being designed so that they may be folded when emptied and returned flat. They are expected to reduce costs of shipping beer, as they will occupy less room and be subject to less damage than bottles.

BRITISH TRADE AT PEAK

Production, Exports and Imports of Steel Reach Post-War Maximums in 1927

WASHINGTON, Jan. 24.—Nineteen twenty-seven marked the peak of the post-war activity of the British iron and steel industry, says a statement prepared by J. Joseph W. Palmer of the Iron and Steel Division, Department of Commerce. Production of both iron and steel reached levels not attained since the easing off from the intensive activity of the war years. Exports and imports likewise reached post-war heights.

The year was marked also by the first concerted effort on the part of the British industry to reduce the tonnages of foreign iron and steel imported for fabrication. It was proposed, Mr. Palmer points out, and put into effect as of Sept. 1, that the British steel makers should pay a rebate to fabricators who purchased all of their steel from British mills up to Jan. 1. On the latter date it was proposed to have a casting up of accounts. No announcement has been made as to the result of the plan.

Imports had been mounting steadily and in 1927 reached a total of 4,406,125 tons, an increase of 17.8 per cent over imports in 1926. The December, 1927, import trade, in reaching the lowest figure for any month of the year, 280,520 tons, registered a loss of 4244 tons as compared with November. The 1927 increase in import trade was participated in by all but two of the 19 classifications into which the trade is divided, rails and wire. The largest increase was in raw and semi-finished steel.

Exports in 1927 were 4,199,665 tons, the highest since the war and 40.2 per cent greater than in 1926. During December, however, British exports fell off sharply to 351,795 tons, a decrease of 47,259 from November.

The largest gain in exports in 1927 was in steel rails, 277,870 tons, which is considered to be particularly significant as rails was one of the few items in the import trade to show reduced tonnage and during the year Continental rail manufacturers were making special efforts to develop their export markets. The second largest increase was shown in plates and sheets, 195,748 tons.

Production of pig iron and steel ingots and castings was well maintained over the whole of 1927. The totals registered for both pig iron and steel for the year, 7,289,600 tons and 9,086,300 tons respectively, represent the largest tonnages recorded in the post-war period.

Two-Thirds of Swedish Ore Exports Go to Germany

HAMBURG, GERMANY, Jan. 7.—Of the total exports of Swedish iron ore last year, 9,690,000 tons, Germany received 68 per cent. The remaining 32 per cent went to Czechoslovakia, Poland, Great Britain, France and other smaller consumers of Swedish iron ore.

French Ferrosilicon Exports Increase Despite Syndicate

HAMBURG, GERMANY, Jan. 7.—Although the European Ferrosilicon Syndicate recently published a report that the competition of French producers, who are not members, had been of less consequence since formation of the syndicate, export statistics indicate the contrary. During the first 10 months of 1925 French ferrosilicon exports were 1480 metric tons, in 10 months of 1926, 2013 tons, and in 10 months of 1927, 3607 tons.

Revenue freight loaded in the first week of January is reported by the American Railway Association at 754,062 carloads. Because this period this year included a holiday, it shows a sharp falling off from the corresponding figures of the two preceding years. Comparing it with the weeks which had the similar holiday, however, the total this year is above either of the two preceding years.

FAR EAST BUYS TIN PLATE

Both Chinese and Japanese Merchants Active—Oil Well Supply Order Placed Here

NEW YORK, Jan. 24.—There is still a fair volume of tin plate business from the Far East. Chinese merchants have been in the market for tin plate waste waste, and one exporter in New York has received an order for about 5000 boxes of waste waste from a purchaser in Shanghai. Current tin plate purchases in Japan are confined to small lots, but the Nippon Oil Co., according to recent cabled reports from Japan, will be in the market for its quarterly requirements about the end of this month. Export quotations on tin plate range from $5.20 to $5.30 per base box, c.i.f. Japanese or Chinese port. There is a moderate volume of inquiry from Japan for light-gage black sheets, but no purchases of consequence are reported at the present level of American mill quotations. While $77 per ton, c.i.f. Japan, might be shaded on a desirable tonnage in bundles of 13 sheets each, the British market is still lower.

The Northern Karafuto Oil Co., Japan, has placed 470 tons of oil well casing and about 48,000 ft. of gas pipe with an exporter in New York for delivery from American makers.

New York importers of European steel report sales of only a small tonnage of bars and shapes. The greater part of this business is in small lots sold from the dock or delivered from stocks maintained here by the importers. Prices of Continental steel range from 1.65c. to 1.75c. per lb., base, for Thomas steel bars and 1.55c. to 1.65c. per lb., base, for structural material, duty paid, New York. Sales from the dock or from stock bring up to 2c., or more, delivered. A fair business is being done by importers in hoops and bands, wire rods and strip steel. The only outstanding construction inquiry is about 4000 tons of reinforcing bars for a bridge near Boston. Although foreign bids for the bars have been accepted, it is believed that domestic material will be purchased. Importers of European sheet steel piling are submitting bids on several hundred tons for the Tacony-Palmyra bridge near Philadelphia. The reinforcing bars for this bridge are expected to go to domestic mills.

A list of inquiries for equipment required in railroad, highway and waterway construction in Colombia has been issued by the Colombian Government Bureau of Information, 1440 Broadway, New York. Included in the list are locomotives, railroad cars, steel bridges, barges, concrete mixers, rails and pipe. Translations of the inquiries, which are in Spanish, are being made and will be available in a few days. Bids on the equipment specified must be in the hands of the Minister of Public Works, Bogota, Colombia, before certain dates in March, April and May.

Newton Bill May Pass; Would Permit Collective Purchases Abroad

WASHINGTON, Jan. 24.—Proponents of the Newton bill to permit collective purchases by domestic consumers of commodities under foreign control are predicting that the measure will pass at this session of Congress. It is supported by Secretary of Commerce Hoover and Secretary of Agriculture Jardine, as well as by a number of important business organizations. The legislation is proposed as an amendment to the Webb-Pomerene export act, which permits American exporters to consolidate for the marketing of their products in foreign markets. At a hearing last week Secretary of Commerce Hoover said the bill would promote trade and not restrain it. No iron and steel or related interests were represented at the hearing.

German Steel Prices to Be Advanced

WASHINGTON, Jan. 23.—German iron and steel interests are reported to have decided upon an increase of 3m. (71c.) per ton in base prices on rods and structural shapes at a recent meeting, according to a radiogram received by the iron and steel division, Department of Commerce, from Fayette W. Allport, Berlin, commercial attaché. This action is a direct result of the pending readjustment of working hours and wage scales to conform to the 8-hr. day decree.

Steel Workers and Machinists Included in Immigrants

Of 27,758 aliens admitted to the United States in November, 1927, 203 were iron and steel workers and 214 were machinists. In the five-month period from July to November, 828 iron and steel workers and 983 machinists were admitted. But in November 33 iron and steel workers and 41 machinists went out of the country and in the five-month period 150 steel workers and 295 machinists departed.

British machine tool production and exports remained practically the same during 1927 as during the two previous years, according to a cablegram received by the Industrial Machinery Division, Department of Commerce, from Commercial Attache William L. Cooper, London. Imports to Sept. 30 increased 16 per cent, the American share of the total imports being 64 per cent or the same as last year. American sales were largely in the way of special purpose tools such as millers, grinders, gear cutters, honers and crankshaft balancing machines.

British Developing New Uses for Stainless Products

New uses for stainless and corrosion-resisting steels are continually being discovered in Great Britain. Rustless iron studs for traffic direction purposes on the roads are now established in popularity, and they are always bright, no matter how wet or damp the weather. Stainless steel is now used in pen manufacture, and there has recently been put on the market a fountain pen with a stainless steel point, which brings the selling price very low in comparison with the cost of a gold point. There is a steady demand for pen steel in thin sheets.

Smallest Year in Automobile Production Since 1922

WASHINGTON, Jan. 23.—Motor vehicles to the number of 3,393,887 were produced in the United States in 1927, comparing with 4,298,799 in 1926, according to the Department of Commerce. Of the 1927 production, 2,938,868 were passenger cars and 455,019 were trucks, comparing with 3,808,753 and 490,046 respectively in 1926.

Production in the United States in December totaled 133,178 motor vehicles, of which 105,784 were passenger cars and 27,394 were trucks. This compares with a total of 134,381 in November, of which 109,742 were passenger cars and 24,639 were trucks. The December total was the lowest for any month since February, 1922.

December production of automobiles in Canada, as reported by the Dominion Bureau of Statistics, was 2277 passenger cars and 1158 trucks, compared with production in November of 5173 passenger cars and 1444 trucks. Production in December, 1926, was 6052 passenger cars and 1700 trucks.

PRODUCTION OF AUTOMOBILES IN UNITED STATES AND CANADA

	1927	1926	1925	1924	1923
Passenger cars:					
U. S.	2,938,868	3,808,753	3,760,459	3,203,049	3,631,728
Canada ..	146,870	164,483	139,311	117,765	129,228
Motor trucks:					
U. S.	455,019	490,046	505,245	397,869	388,527
Canada ..	32,556	40,609	22,078	17,481	17,210
All motor vehicles:					
U. S.	3,393,887	4,298,799	4,265,704	3,600,918	4,020,255
Canada ..	179,426	205,092	161,389	135,246	146,438

The National Metal Trades Association will hold its annual convention at the Hotel Astor, New York, April 25-26, J. E. Nyhan, Peoples Gas Building, Chicago, is secretary.

Machinery Markets and News of the Works

AUTOMOTIVE PURCHASES

Motor Car Companies Come Into Market for Machine Tools

Railroads Are Buying Very Little but Two Western Roads Will Soon Issue Large Lists

WITH renewed buying interest among automobile manufacturers and prospects that railroad purchasing will soon be in larger volume, the machine tool industry expects that February will bring further business improvement.

Automobile companies placed a number of orders during the week. The Ford Motor Co. bought special machinery for making rear axles; Dodge Brothers, Inc., added tools to increase manufacturing capacity for one of its models, and purchases also were made by the Packard Motor Car Co. Cincinnati machine tool builders received orders from the automobile industry for 13 17-in. lathes and 12 special lathes.

Railroad purchases consisted chiefly of single tools bought by the Missouri Pacific, Texas & Pacific and Central Railroad of New Jersey. At Chicago two lists are expected soon from Western roads covering a total of about $750,000 worth of shop equipment.

The Mergenthaler Linotype Co., Brooklyn, was the largest purchaser in the East, closing for about $100,000 worth of lathes, grinders, radial drills and milling machines.

The Firestone Tire & Rubber Co., Akron, Ohio, which will equip a new plant at Los Angeles, Cal., announces that purchases will be made on the Pacific Coast.

New York

NEW YORK, Jan. 24.

SELLERS of machine tools report a satisfactory number of inquiries for single tools and a moderate volume of purchasing. The outstanding buyer in this district is the Mergenthaler Linotype Co., Brooklyn, which is reported to have closed in the past week on tools valued in excess of $100,000. Included in this total, which represents part of the company's requirements, were 17 lathes reported purchased from the Monarch Machine Tool Co., three lathes from the Hendey Machine Co., a number of LeBlond grinders, also several radial drills and milling machines.

Purchasing by railroads is still inactive. The New York Central is still out of the market and no action as yet reported on the list of about 30 tools and other equipment for Delaware, Lackawanna & Western. Central Railroad of New Jersey has closed on a 30-in. x 16-ft. lathe and 2-in. Acme double bolt cutting machine with the Niles-Bement-Pond Co., and Pullman Car & Mfg. Corporation has bought a 32-in. Acme shaper from the same company.

Other purchases of tools have included a No. 2 axle lathe by Lehigh Coal & Navigation Co. and a No. 3 axle lathe by a company in New Jersey, two Cincinnati high-speed tapping machines by an Indiana company, a 6-in. vertical shaper by a Chicago manufacturer, a 12-in. vertical shaper by a Detroit motor car company and a No. 2 jig boring machine by a Cleveland manufacturer.

Contract has been let by Union Railway Co., 2396 Third Avenue, New York, to Andrew J. Robinson Co., 15 West Thirty-eighth Street, for a one-story shop and extensions and improvements in power house at its repair works, West Farms Road and 172nd Street, to cost $30,000.

O'Brien Electric Co., Inc., 505 West 125th Street, New York, manufacturer of electric equipment, has acquired four-story building at 327 West 126th Street, and will remodel for a new plant.

Tolhurst Machine Works, Inc., has been organized with capital of 100 shares of stock, no par value, to take over and expand company of same name with New York headquarters at 30 Church Street, and main plant at Troy, N. Y., manufacturer of centrifugal machinery, etc., to which will be added boilers, engines, and affiliated equipment. Incorporators include George S. Montgomery, Jr., Roy C. Wilson and I. F. Willey, Fifty-third Street and Lansdowne Avenue, Philadelphia, Pa.

Bacu Ice Co., Elm Place and High Street, Poughkeepsie, N. Y., has plans for three-story ice-manufacturing and cold storage plant, to cost more than $75,000; C. J. Cooke, 25 Cannon Street, architect.

Franklin, Gates & Heindsmann, 2526 Webster Avenue, New York, architects, have plans for two one-story automobile service, repair and garage buildings, 100 x 200 ft., to cost about $185,000 with equipment.

American Zinc, Lead & Smelting Co., 331 Madison Avenue, New York, has authorized plans for extensions and improvements in plant at East St. Louis, Ill., including installation of additional machinery, with storage equipment for sulphuric acid, etc., to cost approximately $725,000. It is purposed to remove portion of plant at Hillsboro, Mo., to East St. Louis and concentrate production there.

Hopwood Retinning Co., 56 Commerce Street, Brooklyn, has awarded general contract to Julius Auserhl, 13911 Queens Boulevard, Jamaica, L. I., for a one-story addition, 55 x 100 ft., including improvements in present works. John E. Cahill, Butler Building, Jamaica, is architect.

Officials of Standard Oil Co., of New Jersey, 26 Broadway, New York, have formed Stanco Products Co., with capital of $10,000,000, to manufacture and develop certain oil specialties heretofore produced by parent organization. An expansion program will be carried out. F. H. Bedford will be president of new company, and C. L. Bowman and A. J. Van Wynan, vice-presidents.

Dry Ice Corporation of America, Inc., 50 East Forty-second Street, New York, has awarded general contract to H. K. Ferguson Co., for a new one and two-story plant, 85 x 150 ft., at Elizabeth, N. J., to cost close to $50,000 with equipment. Manufacture will be carried out under special chemical process.

Lancia Motors of America, Inc., New York, lately formed under State laws with capital of $3,000,000 by interests connected with Lancia Motors Corporation, 140 West Fifty-seventh Street, has acquired a plant at Poughkeepsie, N. Y., with floor space of 129,000 sq. ft. on 14-acre tract, and will use for a new assembling plant for Lancia automobiles of Italy. It is purposed to have works ready for service by July, with facilities for an output of 250 cars per month.

American Telephone & Telegraph Co., 195 Broadway, New York, is arranging a construction and expansion program to cost $38,000,000, including aerial wire and pole lines, $4,341,000; long-distance cable lines, conduits, buildings and equipment, $19,791,000; switchboards, telephone and telegraph instruments, $9,519,000; line work, wire and pole replacements, etc., $4,345,000.

Harry Albanese, Inc., 63 Whipple Street, Brooklyn, plumbing equipment and supplies, has plans for a two-story factory, 25 x 100 ft., to cost about $23,000 with equipment. Laspia & Samenfeld, 269 Broadway, are architects.

Barozzi Drying Machine Co., 940 Van Wagenen Avenue, North Bergen, N. J., has plans for a two-story addition, 50 x 100 ft., to cost close to $50,000 with equipment. P. O. Simone & Co., 100 Sip Avenue, Jersey City, N. J., are architects.

The Crane Market

THERE are several inquiries for large capacity overhead cranes such as the two 120-ton and one 65-ton cranes for the Public Service Production Co., Newark, N. J., and a 150-ton crane for the Phoenix Utility Co., New York, but the greater number of current inquiries are for cranes ranging in capacity from 5 tons to 15 tons. The New York Edison Co., New York, has been asking for prices on a small capacity monorail hoist with bucket. The New England Public Service Co., Augusta, Me., is in the market for a 40-ton, 28-ft. span hand power crane with two 20-ton trolleys.

The Central Board of Purchases, Milwaukee, has rejected all bids on two electric traveling cranes for a new incinerating plant and is advertising for new quotations.

Among recent purchases are:

Blue Ridge Coal & Coke Co., Bluefield, W. Va., 30-ton, wide gage locomotive crane from Ohio Locomotive Crane Co.

E. H. Clement Co., Charlotte, N. C., 5-ton crawl-tread locomotive crane from Browning Crane Co.

Consolidated Gas Co., New York, 10-ton crawl-tread locomotive crane, from an unnamed builder.

Atlantic Aircraft Corporation, Hasbrouck Heights, Teterboro, N. J., has leased portion of former textile mills at Passaic, N. J., totaling 30,000 sq. ft., for expansion. New factory will be used primarily for production of wings, frames, etc., for airplanes of Fokker type, as manufactured by company. Major Lorillard Spencer is president.

Consolidated Safety Pin Co., 46 Farrand Place, Bloomfield, N. J., has plans for three-story addition, 35 x 74 ft., to cost about $45,000. Floyd Y. Parsons, 1123 Broadway, New York, is architect.

Public Service Electric & Gas Co., Public Service Terminal, Newark, is arranging an expansion and improvement program to cost $22,000,000, including extensions in power plants, substations and transmission lines, etc. Gas division of company will expend close to $4,500,000 for expansion and betterments in artificial gas plants and system. Plans are under way for two-story equipment storage and distributing plant, with repair department, for electrical division at Jersey City, two-stories, 125 x 192 ft., to cost $150,000.

V. and R. Tedeschi, 25 Mercer Street, Newark, have plans for two-story machine shop, 68 x 100 ft., to cost $45,000 with equipment. J. B. Acocella, 9 Clinton Street, is architect.

Wesley & Winter, 90 Mechanic Street, Newark, manufacturers of paper goods, have leased an adjoining three-story factory for expansion.

Philadelphia

PHILADELPHIA, Jan. 23.

PLANS are maturing for a four-story mechanical engineering building at Drexel Institute, Philadelphia, to cost $350,000 with equipment, and Board of Trustees, Dr. K. G. Matheson, president, will ask bids soon on general contract. Simon & Simon, 249 South Juniper Street, are architects.

Pennsylvania Railroad Co., Philadelphia, C. E. Walsh, room 415, 15 North Thirty-second Street, purchasing agent, is asking bids until Feb. 2 for steel transmission towers, contract 7-1928.

Silverman & Levy, 313 South Smedley Street, Philadelphia, architects, will soon take bids for four-story automobile service, repair and garage building, to cost in excess of $125,000 with equipment.

Philadelphia Stock Yards Co., Thirtieth Street, Philadelphia, is considering construction of an abattoir with cold storage and refrigerating division; elevating, conveying and other mechanical equipment, to cost $1,000,000.

Campbell Soup Co., Camden, N. J., has authorized plans for a new group of multi-story factory units, with power house on Delaware River waterfront, vicinity of its present plant, to cost more than $2,500,000 with machinery, including conveying, elevating, and other mechanical equipment, can machinery, etc. Plans for first unit, totaling 20 acres of floor space, have been filed. Company has also awarded contract to Henry Ericsson Co., 228 North La Salle Street, Chicago, for six-story factory, 245 x 340 ft., on West Thirty-fifth Street, Chicago, to cost approximately $1,000,000 with equipment. Other units will be built later at last-noted location.

Board of Education, Princeton, N. J., is considering installation of manual training equipment in new two-story high school to cost $750,000, for which superstructure will soon begin; Ernest Sibley, Bluff Road, Palisade, N. J., architect.

Lycoming Mfg. Co., Williamsport, Pa., manufacturer of automobile engines, is completing plans for establishment of new works division for production of airplane motors of company design.

Shenango Motor Co., West Washington Street, New Castle, Pa., will soon take bids on general contract for five-story service, repair and garage building, 85 x 170 ft., to cost about $200,000 with equipment.

Glen-Gary Shale Brick Co., Reading, Pa., has arranged for bond issue of $600,000, portion of proceeds to be used for expansion and improvements. Two plants are operated at Reading; one at Shoemakersville; and one at Harrisburg, Pa., with total output of 300,000 brick per day; expansion program calls for machinery and facilities to increase gross capacity to 430,000 brick daily.

Bridgeport Iron Works, Inc., Bridgeport, Pa., recently formed by A. I. Pollock, South and Eden Streets, Pottstown, Pa., and associates, will operate a local steel fabricating plant and general iron works. G. Plantau Middleton, 637 West Philadelphia-Ellena Street, Germantown, Philadelphia, is also interested in company.

Sun Oil Co., Finance Building, Philadelphia, has acquired 65 acres of sulphur bearing land at Boling Dome, Tex., and proposes installation of equipment for development and plant for sulphur recovery.

McClintic-Marshall Co., Pottstown, Pa., has work under way on one-story addition for assembling service, 125 x 600 ft., at its local steel fabricating works, to cost more than $150,000.

Owens Aircraft Corporation, Glenside, Pa., has been formed to manufacture airplanes. Company plans to lease plant in Philadelphia and will be in market for usual materials and standard parts used in aircraft construction. Factory equipment will also be purchased.

South Atlantic States

BALTIMORE, Jan. 23.

ARRANGEMENTS have been made by Arlington Ice & Fuel Co., Baltimore, recently organized, for purchase of plant of Zimmerman Ice Co., local. New owner will remodel and install additional equipment for capacity of 100 tons per day.

Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has arranged for a preferred stock issue of $10,000,000, portion of fund to be used for expansion and betterments, including completion of new unit at power plant on Gould Street. Company is negotiating for purchase of Northern Maryland Power Co., operating at Havre de Grace and vicinity and plans extensions in that territory.

A. S. Lee Co., Norfolk, Va., plans rebuilding portion of its lime and fertilizer plant destroyed by fire Jan. 15, with loss of $50,000 including machinery.

U-Drive-It Co., 310 Monticello Avenue, Norfolk, Va., has awarded general contract to Claiborne & Taylor, Atlantic Life Building, Richmond, Va., for a two-story automobile service, repair and garage building, to cost close to $100,000 with equipment.

Ahoskie Supply Co., Ahoskie, N. C., has inquiries out for a squaring shear for installation at its plant.

Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Feb. 7 for reduction gear units and spares for Mare Island, Puget Sound and Brooklyn Navy Yards, schedule 8343; until Jan. 31 for wire rope for Eastern and Western yards, schedule 8332; until Jan. 31 for gasoline engines and spares for submarine base, schedule 8357, and until Feb. 7 for bolts and nuts for Eastern and Western yards, schedule 8333.

Champion Fibre Co., Canton, N. C., is said to be arranging expansion and improvement program at local mill to cost about $200,000, including new steam-operated electric power plant, for which foundations will soon be laid. Headquarters at Hamilton, Ohio.

Board of Trustees, Loyola College, Evergreen and Charles Streets, Baltimore, has plans for a three-story and basement mechanical engineering building, to cost approximately $150,000 with equipment. Lucius R. White, Hearst Tower Building, is architect.

Morganton Furniture Co., Morganton, N. C., has plans for one-story addition, 80 x 260 ft., to cost about $45,000 with equipment.

Board of Education, Atlanta, Ga., is considering installation of manual training equipment in two-story William A.

Bass junior high school to cost $160,000, for which superstructure will soon begin. G. Lloyd Preacher & Co., Wynne-Claughton Building, are architects.

International Harvester Co., 6065 Michigan Avenue, Chicago, is said to be planning establishment of a factory branch and distributing plant at Raleigh, N. C., with service and repair department. It is proposed to establish a local assembling works later.

General Equipment Machinery Co., Inc., 116 Northeast Sixth Street, Miami, Fla., has taken over machinery department of I. E. Schilling Co., and will act as distributer of machinery and equipment. Plans are under way for establishment of a branch office at Jacksonville, Fla.

Bids are being asked by Bureau of Yards and Docks, Navy Department, Washington, until Feb. 8 for a one-story motor-testing building, 25 x 161 ft., at naval air station, Pensacola, Fla., specification 5524.

Board of Awards, City Hall, Baltimore, is disposing of a bond issue of $1,500,000, proceeds to be used for a municipal airport, including hangars, mechanical and repair shops, pumping station and other structures, with equipment.

West Knitting Corporation, Syracuse, N. Y., plans construction of a one-story steam-operated electric power plant at its proposed mill at Wadesboro, N. C., entire project to cost in excess of $100,000. R. C. Biberstein, 1614 Elizabeth Avenue, Charlotte, N. C., is architect.

Edisto Public Service Co., Denmark, S. C., has acquired electric light and power plant at Allendale, S. C., and plans expansion and improvements in that section, including transmission line construction.

Wood Mfg. Co., Norfolk, Va., has acquired property at Planters Avenue and Cromwell Road, and plans erection of one-story furniture manufacturing plant, to cost $80,000 with equipment.

Piedmont Print Works, Inc., Taylors, S. C., is asking bids until Jan. 30, for a new local textile print mill, including one and two-story machine shop, 100 x 150 ft., and boiler plant. J. E. Sirrine & Co., Greenville, S. C., are architects and engineers.

D. Q. S. Brick Co., Berlin, Md., is planning purchase of additional equipment, including motor-driven, 24-in. gage locomotive, about 2-tons capacity; crawler type digger, about ½-yd. capacity; side-dump clay cars, etc.

Harbison-Walker Refractories Co., Farmers' Bank Building, Pittsburgh, has plans for new works in Curtis Bay district, Baltimore, where 30 acres was purchased several months ago. It will be devoted to production of chrome and magnesite brick and will cost close to $1,000,000 with machinery. Contract for two tunnel kilns has been let to American Dressler Tunnel Kilns, Inc., Cleveland, and awards for machinery and operating equipment will be made soon.

Buffalo

BUFFALO, Jan. 23.

BIDS will soon be asked on general contract by Houde Engineering Corporation, 237 Winchester Avenue, Buffalo, manufacturer of automobile shock absorbers, for a two-story addition, 210 x 225 ft., to cost upward of $200,000 with equipment. G. Morton Wolfe, 1377 Main Street, is architect.

Hecker-Jones-Jewell Milling Co., St. Clair Avenue, Buffalo, has taken out permit for a new grain elevator to cost $950,000, including elevating, conveying and other machinery.

United States Radiator Corporation, Dunkirk, N. Y., has arranged for increase in capital from 200,000 to 400,000 shares of stock, no par value, portion of proceeds to be used for expansion and improvements.

Roessler & Hasslacher Chemical Co., Buffalo Avenue and Twenty-sixth Street, Niagara Falls, N. Y., manufacturer of industrial chemicals, has awarded general contract without competition to Wright & Kremers, Inc., Pine Avenue and Main Street, for a one-story addition, 110 x 350 ft., to cost more than $65,000 with equipment.

Willett W. Wetmore, 364 Voorhees Avenue, and S. M. Quackenbush, 1580 Amherst Street, Buffalo, have formed W. W. Wetmore Corporation, with capital of $25,000 and 500 shares of stock, no par value, and plans early establishment of plant for manufacture of heating equipment.

Erie County Board of Supervisors, Buffalo, has made available appropriation of $30,000 for equipping shops for additional industries at County penitentiary at Mill Grove. Walter W. Nicholson is commissioner of corrections.

Fire, Jan. 21, caused loss of $40,000 to boiler plant of Otis-Sawyer Co., Oswego, N. Y., manufacturer of small heating boilers.

New England

BOSTON, Jan. 23.

ALTHOUGH trade is far from active, more machine tools were sold in this district the past week than in the previous month and a half. Inquiries are more numerous than at any time since last October and include two 18-in. and several larger lathes, radial drills, boring mills and a large planer from New England railroads, and quite a list of smaller machines from numerous manufacturers. Some companies inquiring for equipment last October have renewed negotiations, and in many instances old quotations will not hold. There is a small inquiry out from the city of Boston for school equipment and it is intimated a large list will shortly be forthcoming.

Recent sales include a new jig borer to a Vermont shop, squaring shear, 28-in. Prentice drill, 14-in. x 6-ft. lathe, saw table to greater Boston users, all used tools; a used two-spindle drill to a Maine shop, two small used presses and several new and used bench lathes to Rhode Island and southern Massachusetts plants. The Pneumatic Drop Hammer Co. has sold two 200-lb., one 300-lb. and one 100-lb. hammers to a Providence manufacturer, one 500-lb. and one 350-lb. hammer to an Indiana plant, and one 500-lb. hammer to a Cincinnati manufacturer and expects to close on several other machines before Jan. 31. Demand for forges is more active than in many weeks. Small tools, gages, etc., are selling better than in two months.

Plans have been completed for one-story, 93 x 95 ft., automobile body and paint shop, at Somerville, Mass., for P. J. Kiley, 101 Washington Street. Plans are private.

Work has started on a one-story, 60 x 90 ft., light manufacturing plant, Dorchester district, Boston, for John F. Duby, 15 Hancock Street, Dorchester, metal and other specialties. Miller & Levi, 46 Cornhill, Boston, are architects.

Plans are nearing completion for a jewelery manufacturing plant at Providence, R. I., for the Jewelers Supply Co., 37 Garnet Street. C. R. Makepeace, 907 Grosvenor Building, Providence, is engineer.

Plans are in progress for an artificial ice making plant at Lynn, Mass., for North Shore Ice Co., 46 Lake Avenue. Plans are private.

Work has started on a four-story, 30 x 101 ft., addition for Edison Electric Illuminating Co., 39 Boylston Street, Boston. Bigelow, Wadsworth, Hubbard & Smith, 11 Beacon Street, Boston, are architects.

Sessmee Lock Co., Hartford, Conn., will increase its capitalization from $500,000 to $750,000 to provide additional working capital. Hartford Machine Co. is at present manufacturing company's product.

Contract has been let by George Muench, 575 Pacific Street, Stamford, Conn., manufacturer of special machinery and parts, to Genovese & Rich, 1 Bank Street, for one-story addition, 50 x 100 ft. Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

Department of Public Buildings, City Hall, Boston, plans construction of an equipment storage and distributing works, with automobile service and repair departments, to cost in excess of $200,000 with equipment.

Central Maine Power Co., Augusta, Me., is reported planning a hydroelectric power development at Bingham, Me., for ultimate capacity of 100,000 hp., to cost more than $8,000,000 with power dam and transmission lines.

Cambridge Sheet Metal Co., 295 Franklin Street, Cambridge, Mass., manufacturer of automobile bodies, etc., has awarded general contract to M. J. Ryan, 763 Massachusetts Avenue, Boston, for one-story addition, 60 x 85 ft., to cost about $25,000 with equipment.

Central Falls Mfg. Co., 121 Lincoln Avenue, Central Falls, R. I., contemplates early rebuilding of portion of woodworking plant and power station recently destroyed by fire, with loss of about $100,000 including machinery.

Herbert C. Hearne, 1389 Main Street, Springfield, Mass., architect, has plans for a three-story automobile service, repair and garage building, 110 x 140 ft., to cost in excess of $125,000 with equipment.

Hartford Gas Co., Hartford, Conn., is planning increase in capital from $500,000 to $3,750,000, a considerable part of proceeds to be used for extensions in artificial gas plants, storage facilities and lines.

Hamden Tool & Metal Works, Hamden, Conn., recently formed by Carl R. Olson, 960 Dixwell Avenue, New Haven, Conn., will soon complete a one-story plant to specialize in manufacture of steel and brass shells.

Connecticut River Power Co., Waterbury, Conn., comprising recent merger of Connecticut Light & Power Co., Connecticut Power Co., Somers Electric Co., and other utilities, has secured permission for a hydroelectric power plant

at Windsor Locks, Conn., to develop an initial capacity of 50,000 hp., to cost about $5,000,000 with transmission lines.

W. H. Hunt & Son, 197 Washington Street, Salem, Mass., architects, are completing plans for a one-story automobile service, repair and garage building, 120 x 150 ft., to cost about $100,000 with equipment.

Bassick Mfg. Co., 2638 North Crawford Avenue, Chicago, manufacturer of lubricating equipment, grease cups, etc., subsidiary of Stewart-Warner Speedometer Corporation, 1826 Diversey Boulevard, has purchased plant of Columbia Phonograph Co., Bridgeport, Conn., for about $350,000, and will remodel for main plant. It is understood that plants of parent company at Meriden, Conn., and Newark, N. J., will be removed to Bridgeport, where operations will be concentrated.

Chicago

CHICAGO, Jan. 23.

ADDITIONAL signs of activity in the machinery market are noted as the third week in January closes. From a rather small beginning the early part of the month sales have steadily mounted and inquiry is now of such proportions that dealers are looking forward to February with optimism. Orders for the most part are widely scattered and of small size. Absence of railroad buying in this district has been marked, but it is understood that two Western railroads are preparing to issue lists that will represent expenditures aggregating $750,000. The St. Paul Railroad is asking for prices on a Williams, White & Co. No. 11 punching machine and a 24-in. x 4-in. double-wheel grinder. At least three manufacturers are in the market for tool room equipment. A hardware specialty manufacturer has purchased a 14-in. x 8-ft. lathe.

Beckwith Iron Works, 544 West Seventy-Ninth Street, Chicago, will build an addition, 40 x 180 ft., to cost $5,000.

Plans are said to be under way for rebuilding portion of plant of Belleville Enameling & Stamping Co., Belleville, Ill., recently destroyed by fire, with loss close to $200,000 with equipment.

Reliance Die & Stamping Co., 501 North La Salle Street, Chicago, has asked bids for a three-story plant, 90 x 255 ft., to cost upward of $125,000 with machinery. A. A. Wickland, 5 South Wabash Avenue, is engineer.

Samuel Olson & Co., 2418 Bloomingdale Avenue, Chicago, manufacturers of conveying and elevating machinery, pneumatic tube systems, etc., have plans for a one and two-story addition, to cost approximately $150,000 with equipment. Waller Co., 510 North Dearborn Street, is architect and engineer.

City Council, Willmar, Minn., is selecting an engineer to prepare plans for extensions and improvements in municipal electric light and power plant, and waterworks, including installation of additional machinery. Hans Gunderson is city clerk.

Atomized Fuel Corporation, 20 North Twelfth Street, Fort Dodge, Iowa, will soon begin superstructure for a new one-story plant, 35 x 126 ft., to cost about $85,000 with equipment.

Manning Light Co., Manning, Iowa, has acquired local property as site for electric light and power plant to cost $200,000, on which work will soon begin.

Viking Pump Co., Cedar Falls, Iowa, is completing plans for a one-story addition, to cost about $21,000 with equipment.

Simplex Mfg. Co., 213 West Austin Avenue, Chicago, manufacturer of roofing specialties, metal flashings, cornices, etc., has asked bids on general contract for a new one-story plant, 50 x 110 ft., to cost $35,000 with equipment. A. E. Strobel, 53 West Jackson Boulevard, is architect.

Board of Education, Rochester, Minn., is considering plans for central power and heating plant for schools to cost $130,000. Bond issue is being arranged.

Chicago, Rock Island & Pacific Railroad Co., 179 West Jackson Boulevard, Chicago, is arranging fund of $775,000 for new locomotive and car repair shops and engine houses at different points during the year. Another fund of $700,000 is being appropriated for new yards, including mechanical facilities; $6,500,000 for new equipment, and $1,650,000 for repairs and reconditioning of present equipment.

Biflex Products Co., North Chicago, Ill., manufacturer of automobile bumpers and other automotive accessories, has disposed of a note issue of $700,000, a portion of proceeds to be used for expansion. Company is acquiring all assets of L. P. Halladay Co., Decatur, Ill., manufacturer of kindred equipment, and will continue operation as a division.

Central Illinois Public Service Co., Springfield, Ill., has arranged for a bond issue of $29,000,000, portion of fund to be used for expansion and improvements, including transmission line construction.

Page Sales Service, Chicago, dealer in overhead electric travelling cranes, hand power cranes, magnetic pulleys, foundry machinery and flexible couplings, has moved its office from 14 East Jackson Boulevard to 608 South Dearborn Street.

Cincinnati

CINCINNATI, Jan. 23.

MACHINE tool builders report that business is quiet, and from present indications bookings this month will fall below those in December. However, many companies which recently raised prices anticipated a lull in buying this month, because consumers closed for equipment before the new schedule became effective. Furthermore, many industrial buyers are slow in making purchases, even though inquiries were issued some time ago. Definite signs of renewed interest on the part of automobile makers are appearing. Two companies in the Detroit district have brought a total of 13 17-in. lathes, while another manufacturer has placed an order for 12 special lathes. As soon as factories get into production on new models and ascertain the amount of business they can depend on in the early part of the year, further buying of machine tools is expected.

Aside from a sale of three engine lathes to the Missouri Pacific and another transaction involving a 5-ft. right line radial drill and a 2500-lb. single frame steam hammer for the Texas & Pacific, orders from carriers have been negligible. The Macor Car Co., Passaic, N. J., has contracted for a No. 3 axle lathe and the Lehigh Coal & Navigation Co., Philadelphia, for a No. 2 axle lathe. Many machine tool executives are of the opinion that an upward turn in business will not come before Feb. 1.

Bids have been asked by Cincinnati Street Railway Co., Dixie Terminal Building, Cincinnati, for a one-story equipment storage and distributing plant with repair facilities and automobile service and garage department, to cost $50,000 with equipment. Garber & Woodward, Leverone Building, are architects.

Department of Water, Cincinnati, is asking bids until Feb. 2 for two pumping units, capacity 30,000,000 gal. per day. Plans are under way for pumping machinery for sewage disposal plant to cost $70,000.

Volunteer State Oil Co., Atlantic and Erie Streets, Knoxville, Tenn., contemplates construction of new storage and distributing plant, with pumping station and other mechanical equipment.

Crane Enamelware Co., Chattanooga, Tenn., subsidiary of Crane Co., Chicago, is reported planning an addition in Alton Park district, to cost upward of $300,000 with machinery.

Battelle Memorial Institute, care of Otto C. Darst, 186 East Broad Street, Columbus, Ohio, architect, has plans for two research buildings including machine shop, engineering shop with electric crane, laboratories, etc. Entire project will cost close to $500,000; work to begin in spring.

Fire, Jan. 9, destroyed portion of building at 907-11 Main Street, Cincinnati, occupied jointly by C. & D. Auto Supply Co., and Pick Pen Co., with combined loss reported more than $125,000.

Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until Feb. 6 for two electric furnaces for heat-treatment of aluminum alloys, with alternate bids for three and four such units, circular 202; until Jan. 31 for miscellaneous engine parts, circular 197; until Feb. 1 for inverted Liberty engine spare parts, circular 199 and until Feb. 3 for three dynamometer scales, 3000-lb. capacity, circular 201.

Neuhoff Packing Co., 1308 Adams Street, Nashville, Tenn., will soon begin erection of addition to cold storage and refrigerating plant to cost about $45,000.

Stowers Lumber & Mfg. Co., Harriman, Tenn., is said to have authorized plans for rebuilding portion of hardwood flooring mill and millwork plant, recently destroyed by fire with loss of $70,000. It is proposed to purchase a standard metal building; also, electric generator, motors, wood-working machinery, etc.

Wombell Automotive Parts Co., Lexington, Ky., contemplates erection of one-story addition and improvements in present plant, with installation of additional equipment.

Knoxville, Tenn., Wiley W. Thomas, purchasing agent, will receive sealed bids up to March 1 on a considerable quantity of used equipment, including pumping machinery, boilers, filters, motors, cranes, etc.

Gulf States

BIRMINGHAM, Jan. 23.

WORK will begin on a one-story addition to the plant of Mason Foundry Co., Laurel, Miss., to cost close to $30,000 with equipment.

Pasotex Petroleum Co., recently formed by Standard Oil Co. of California, 225 Bush Street, San Francisco, is reported planning construction of a new refinery near El Paso, Tex., to cost close to $750,000 with equipment.

Standard Ice Co., Houston, Tex., will build one-story ice-manufacturing plant, to cost approximately $100,000 with machinery. E. Q. Staph is consulting engineer.

Colbert County Board of Education, Tuscumbia, Ala., Robert Hudson, superintendent, has plans for a vocational school for negroes at Leighton, to cost more than $75,000 with equipment.

River Falls Power Co., River Falls, Ala., has applied for permission to proceed with construction of auxiliary steam-operated electric power plant, to cost $150,000 with machinery.

Cities Service Gas Pipeline Co., operated by Cities Service Co., 60 Wall Street, New York, has arranged for bond issue of $12,000,000, portion of fund to be used for expansion in pipe lines and properties in Texas Panhandle district, including compressor stations. Company has recently completed building a line from section noted to Wichita, Kan.

City Council, Vernon, Tex., will receive bids until Feb. 6 for one 360-hp. Diesel engine, direct-connected to electric alternator, with belt-driven exciter, switchboard and auxiliary equipment, for service at municipal light and water plant.

Houston Gas Securities Co., Houston, Tex., operating Houston Gulf Gas Co., and Houston Gas & Fuel Co., has purchased plants and properties of Southern Gas Co., San Antonio, Tex., for $3,500,000. Acquired company has begun new pipe line to Austin, Tex., and vicinity, which will be completed by purchasing organization. Latter company will also make other extensions and betterments in natural gas properties and distribution, including pipe line construction.

Florida Cold Storage Co., Orlando, Fla., is said to have plans for a new cold storage and refrigerating plant, to cost in excess of $300,000 with machinery. Lockwood, Greene & Co., Johnston Building, Charlotte, N. C., are architects and engineers. W. O. Overstreet is president.

Northern Texas Traction Co., Third and Main Streets, Fort Worth, Tex., is said to be planning a new bus terminal, with service, repair and garage divisions for motor bus service, to cost in excess of $200,000 with equipment.

Central Power & Light Co., First National Bank Building, Victoria, Tex., has plans for extensions and improvements in ice-manufacturing plant. Ice conveyor will be installed in connection with other equipment.

Central States Power & Light Co., Kahl Building, Davenport, Iowa, has purchased four ice-manufacturing plants of Laurel Ice & Packing Co., Laurel, Miss., two being located at Laurel; one at Ellisville, Miss., and another at Heidelberg, Miss. New owner is reported planning expansion and improvements, including installation of new equipment.

Phillips Petroleum Co., Bartlesville, Okla., will construct and operate three new plants for production of carbon black, in Carson, Hutchinson and Gray Counties, respectively, each to include machine and mechanical shops, tool houses, equipment storage and distributing plants, pipe lines and compressor stations. It is proposed to have units completed within six months, with cost placed in excess of $250,000 with equipment.

City Council, Orlando, Fla., is said to have plans under way for municipal airport on 50-acre tract at Lake Underhill, recently acquired, with hangars, machine repair and mechanical shops, pumping station and other buildings, to cost in excess of $100,000 with equipment.

East Plains Gas Co., Amarillo, Tex., is planning construction of a pipe line about 60 miles long, for natural gas service at Wewaka, Farnsworth, Spearman and vicinity, to cost $350,000 with equipment.

Seaboard Coal Co., 25 Broad Street, New York, is reported planning construction of coal terminal on former site of plant of Alabama Drydock & Shipbuilding Co., Mobile, Ala., with elevator type of loading equipment, conveying machinery and other mechanical equipment, to cost about $150,000.

Canadian Ice Co., New Orleans, is completing plans for one-story ice-manufacturing plant, 60 x 120 ft., to cost close to $100,000 with machinery.

Contractors' Rock Asphalt Co., John Wills, 913 South Fortieth Street, Birmingham, recently organized with capital of $275,000, is planning development and operation of asphalt mines in vicinity of Florence, Ala., to cost in excess of $75,000.

Pittsburgh

PITTSBURGH, Jan. 23.

ORDERS have been coming in fairly well for machine tools on which original inquiries were made the latter part of last year. Some dealers already have put the month down as a good one and there are few who do not report improvement in sales compared with December. An exceptionally lively inquiry is noted for heavy rolling mill equipment, although for the most part prices asked at this time are chiefly for estimating purposes.

Carnegie Steel Co. has revived the project of an open-hearth furnace plant for its Mingo, Ohio, works, which it is believed will mean installation of a new blooming mill, besides cranes and other auxiliary equipment. Jones & Laughlin Steel Corporation is said to have elaborate plans on paper for betterments and extensions at its Aliquippa works. Mention is made also of another seamless pipe unit at Gary works of the National Tube Co.

American Rolling Mill Co., Middletown, Ohio, has bought 50 type CL carbon circuit breakers, capacities ranging from 1200 to 10,000 amperes, from Westinghouse Electric & Mfg. Co.

Contract has been let by Automatic Gas-Steam Radiator Co., Fulton Building, Pittsburgh, to Rust Engineering Co., 311 Ross Street, for a one-story plant, 100 x 200 ft., to cost $55,000 with equipment.

Board of Education, Farrell, Pa., contemplates installation of manual training equipment in new high school to cost $500,000, for which plans will soon be prepared. H. W. Bovard, president.

Chicago Pneumatic Tool Co., Franklin, Pa., is continuing expansion program at its local plant and has let contract to Hughes-Foulkrod Co., 421 Seventh Avenue, Pittsburgh, for two one-story additions, 40 x 53 ft., and 35 x 70 ft., to be equipped as a foundry and power house, respectively, to cost in excess of $75,000. Headquarters are at 6 East Forty-fourth Street, New York.

Dravo Contracting Co., Neville Island, Pittsburgh, plans immediate expansion in its steel barge plant at Wilmington, Del., including construction of four additional shipways, wth shops and operating facilities.

Milwaukee

MILWAUKEE, Jan. 23.

EVIDENCES of an improving demand for machine tools are appearing, and the volume of sales is growing more satisfactory as the season advances. Interest among automobile manufacturers is showing a healthy increase following the national and local shows. There is no disposition to buy heavily, but the fact that some shops are now going beyond urgent replacement needs is regarded as encouraging. Inquiry generally is improved and the trade considers February prospects relatively good.

Metro-Nite Co., Hammond and Hopkins Avenues, North Milwaukee, Wis., manufacturer of paint ingredients from stone, is letting contracts for equipment of a $50,000 addition. Requirements include one bucket elevator, screw conveyor, pan conveyor, belt return conveyor and several 65-ton steel bins. Contract for set of screens has been placed with Sturtevant Mill Co., Boston, Mass.

Allover Mfg. Co., 1200 Irving Place, Racine, Wis., manufacturer of hair clippers, expects to make immediate repairs and replacements to offset damage of $10,000 or more to plant and equipment on Jan. 16.

Northwestern Motor Co., Eau Claire, Wis., builder of heavy-duty gas engines, is erecting a one-story addition, 50 x 66 ft. General contractors are Walker & Olson, 716 Churchill Street, local.

J. A. Barnes Machine Co., 123 Marion Street, Oshkosh, Wis., has sold its machine shop and real estate to Oshkosh Auto Parts Co., and is preparing to build a new shop early in spring.

Manitowoc Board of Industrial Education, Manitowoc, Wis., is about to select an architect to make plans and estimates for new unit of vocational training school, to

cost $250,000 with equipment. A. L. Nimtz is vocational director.

Common Council, Stoughton, Wis., has engaged Power Engineering Co., Minneapolis, Minn., to take charge of modernizing municipal electric light and power plant and recommend replacement equipment. Work is estimated to cost upward of $30,000.

Wisconsin Power & Light Co., Madison, Wis., has been granted permission to construct and operate a 20,000-hp. hydroelectric generating plant on Wolf River, in Menominee Indian Reservation, near Shawano, Wis. Mead & Seastone, Madison, Wis., are consulting engineers.

Terminal Warehouse Co., 274 South Water Street, Milwaukee, is preparing to call for bids about Feb. 15 for construction of a new storage building, 147 x 323 ft., five stories and basement, accommodating railroad tracks, and 420 ft. of docks at West Water and Buffalo Streets. Investment will exceed $1,000,000. E. D. Fryer is president and general manager.

Adjutant General's Department, State of Wisconsin, Madison, will be ready for bids Feb. 18 for construction and equipment of a waterworks system in State military reservation at Camp Douglas, Wis., to cost $70,000. Specifications include two 200-gal. electric motor-driven pumping units, 50,000-gal. steel storage tank, 8000 lin. ft. of 6-in. cast iron mains. Work is in charge of Maj. Henry C. Hengels, State military architect, 445 Milwaukee Street, Milwaukee.

Board of Industrial Education, Neenah, Wis., has directed John D. Chubb, architect, Chicago, to revise plans for new senior high and vocational training school to cost $250,000. Original bids were rejected and new bids will be taken about Feb. 15. Mrs. J. F. Dillingham is secretary of board.

Cleveland

CLEVELAND, Jan. 23.

A FAIR amount of activity in machine tools has developed in the automotive industry in Detroit the past week. Stimulation of the market in that city appears to be due to increase in motor car production. Automobile companies which placed fair sized orders include the Ford Motor Co., which bought special machinery for making rear axles; Dodge Brothers, Inc., equipment for increasing manufacturing capacity for one of its models; and Packard Motor Car Co.

In this territory there is a moderate demand for single tools. Some business in vertical milling machines and shapers is coming from rubber mold manufacturers in Akron. The Firestone Tire & Rubber Co. has announced that equipment for its new Los Angeles plant will be purchased on the Pacific Coast. Turret lathes continue to move in fair volume, a local manufacturer having taken quite a few single machine orders since the recent price advance.

Contract has been let by Forest City-Walworth Foundries Co., 4500 Euclid Avenue, Cleveland, to Super-Built Construction Co., 1836 Euclid Avenue, for a two-story addition, 85 x 100 ft., to cost about $50,000 with equipment. Paul Schmidt, address noted, is engineer.

Sanymetal Products Co., Urbana Road, Cleveland, has awarded general contract to Austin Co., for a one-story addition, 75 x 220 ft., to cost about $70,000 with equipment.

Baltimore & Ohio Railroad Co., Baltimore, is planning construction of a locomotive house with repair facilities, power plant, steel water tank and tower, and other mechanical facilities at Youngstown, Ohio, to cost upward of $250,000. Work will be carried out in connection with expansion program in this district to cost approximately $1,000,000.

Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, architects, have plans for a two-story automobile service, repair and garage building to cost close to $100,000 with equipment.

Officials of Fairfield Engineering Co., Marion, Ohio, manufacturer of mechanical equipment, have formed Grain Mfg. Co., to manufacture special farm equipment for production of grain products. A portion of Fairfield works will be given over to production. H. B. Walker is president and treasurer.

Cleveland Railway Co., Hanna Building, Cleveland, has awarded general contract to Austin Co., for three-story automobile service, repair and garage building, 100 x 125 ft., to cost about $200,000 with equipment. Wilbur Watson & Associates, 4614 Prospect Street, are architects and engineers.

Artcraft Sign Co., East Kibby Street, Lima, Ohio, is considering construction of a one and two-story addition, 60 x 180 ft., to cost more than $40,000. A two-story office building, 60 x 70 ft., is also planned.

Cleveland Electric Illuminating Co., Illuminating Building, Cleveland, will soon begin erection of four-story power substation, 56 x 130 ft., to cost $100,000 with equipment.

General Instrument Co., Akron, Ohio, has been organized to manufacture oil, gasoline and other liquid gages for industrial purposes. It will also make indicating gages for domestic oil burners and dash gages for automobiles. No plant will be built at present, but company will assemble parts purchased elsewhere, particularly die castings and stampings.

Indiana

INDIANAPOLIS, Jan. 23.

PLANS are being considered by Ames Shovel & Tool Co., Anderson, Ind., for three one-story additions, to cost close to $100,000 with equipment. Work is expected to begin early in summer. E. F. Miller, Farmers' Trust Building, is architect. Headquarters are at 1 Court Street, Boston.

V. M. Nussbaum & Co., 220 Montgomery Street, Fort Wayne, Ind., have inquiries out for a 200-kva. steam engine-generator set, non-condensing engine unit, generator to be 220-volt, 3-phase, 60-cycle.

Fire, Jan. 20, destroyed portion of plant of Case Radio Co., Marion, Ind., operated by Indiana Mfg. & Electric Co., with loss reported at $250,000 including equipment; boiler plant also destroyed.

Bishop, Knowlton & Carson, 312 North Meridian Street, Indianapolis, architects, have completed plans for three-story and basement automobile service, repair and garage building, to cost about $100,000 with equipment.

Parts Corporation, 733 Virginia Avenue, Indianapolis, manufacturer of automobile parts, has plans for two-story addition, 35 x 225 ft., to cost approximately $60,000 with equipment. Foltz, Osler & Thompson, J. F. Wild Building, are architects.

Following recent organization of Servel, Inc., Evansville, Ind., to take over and operate Servel Corporation, manufacturer of electric refrigerating equipment, plans are being arranged for concentration of all production at local plant, including motor-driven compressor type and electrolux absorption type refrigerating units and parts. Other works will be discontinued. Col. Frank E. Smith is president of new company, and W. F. Thatcher, vice-president.

J. W. Lanahan and G. R. Dumphy, Vincennes, Ind., automobile dealers, have purchased a half block of property in business district and plan erection of multi-story service, repair and garage building, to cost close to $100,000 with equipment.

City Council, Muncie, Ind., plans installation of pumping machinery, power and other equipment in connection with proposed sewage disposal works, to cost more than $2,000,000. Pearce, Greeley & Hanson, 6 North Michigan Avenue, Chicago, are engineers.

St. Louis

ST. LOUIS, Jan. 23.

PLANS are being considered by Gould Castings Corporation, Gould Road and Quincaro Boulevard, Kansas City, Kan., for one-story foundry addition, to cost about $25,000 with equipment.

Southwestern Sales Corporation, Atlas Life Building, Tulsa, Okla., has approved plans for a one-story generating plant, to cost more than $40,000 with equipment. Charles S. Dilbeck, Tulsa Building & Loan Association Building, is architect.

Galion Iron Works & Mfg. Co., 1321 West Ninth Street, Kansas City, Mo., has arranged for increase in capital from $1,500,000 to $3,000,000, portion of fund to be used for expansion.

Central States Utilities Corporation, operating Central States Pipe Line Corporation, Wetumka, Okla., and other electric light and power utilities in Oklahoma, Missouri, Arkansas, Iowa, and other States, is arranging for bond issue of $3,000,000, portion of fund to be used for expansion and improvements, including transmission line construction.

Neligh Electric Light Co., Neligh, Neb., has approved plans for a steam-operated electric power plant, 40 x 110 ft., to cost approximately $100,000 with equipment.

J. A. Semmelmeyer Belting Co., 6630 Waterman Avenue, St. Louis, manufacturer of mechanical belting, is consider-

ing erection of one-story addition, 100 x 120 ft., to cost close to $40,000 with equipment.

National Milling Co., 2221 Front Street, Toledo, Ohio, is reported planning a new flour mill at Kansas City, Mo., to cost more than $600,000 with machinery. Company is affiliated with National Biscuit Co., New York.

Camden Ice & Coal Co., Camden, Ark., has engaged George E. Wells, Security Building, St. Louis, consulting engineer, to prepare plans for rebuilding portion of ice-manufacturing and cold storage plant recently destroyed by fire.

Board of Education, Wellington, Kan., plans installation of manual training equipment in new high school to cost $275,000, for which plans are being completed by Schmidt, Boucher & Overend, Fourth National Bank Building, architects.

Continental Gas & Electric Corporation, Kansas City, Mo., operating Kansas City Power & Light Co., Iowa-Nebraska Light & Power Co., Panhandle Power & Light Co., and other utilities, is disposing of bond issue of $36,000,000, portion of fund to be used for expansion in power plants and system.

Ovens, power equipment, conveying and other machinery will be installed in new plant, 140 x 150 ft., to be erected at Tulsa, Okla., by C. J. Patterson Corporation, 4050 Penn Street, Kansas City, Mo., baker, to cost close to $100,000; and in similar plant of like size at Oklahoma City, Okla., to cost same amount.

Atchison, Topeka & Santa Fe Railway Co., Topeka, Kan., is said to be arranging an appropriation of $250,000 for extensions in engine house and shops, freight houses and yards at San Angelo, Tex., with installation of additional equipment. H. W. Wagner is chief engineer.

Detroit

DETROIT, Jan. 23.

OFFICIALS of Hess Aircraft Co., Wyandotte, Mich., have formed Alliance Aircraft Co., to acquire property at Alliance, Ohio, for new plant for assembling, for which site will soon be secured. It is reported to cost in excess of $40,000.

Pere Marquette Railroad Co., Detroit, has awarded general contract to Owen-Ames-Kimball Co., Grand Rapids, Mich., for extensions and improvements in engine house and shops at Grand Rapids, to cost about $75,000 with equipment.

Monroe Paper Products Co., West Street and Elm Avenue, Monroe, Mich., is considering a one-story addition to cost more than $50,000 with equipment.

Grand Trunk Railway Co., 400 East Jefferson Street, Detroit, is arranging an expansion and improvement program to cost in excess of $10,000,000. Portion of work will comprise extensions at its Pontiac shops and yards, including new engine terminal, machine shops, turntable, power house building and equipment, coaling facilities, standpipes, to cost more than $750,000 with equipment. Company will also install an electric block signal system on line between Battle Creek, Mich., and Granger, Ind., to cost close to $245,000 with equipment.

Detroit Stoker Co., General Motors Building, Detroit, has plans for a two-story addition at Monroe, Mich., to cost about $25,000. Reed M. Dunbar, Kiburtz Building, Monroe, is architect.

John R. Kerby, village clerk, Grosse Pointe Farms, Mich., is asking bids until Feb. 20 for pumping machinery with capacity of 31,650 gal. per min., with accessory equipment, for sewage system. Hubbell, Hartgering & Roth, Buhl Building, Detroit, are consulting engineers.

Michigan Electric Power Co., Bad Axe, Mich., is arranging an expansion and improvement program in Thumb district to cost about $500,000, including extensions in power plants and transmission lines. E. L. Edwards is general manager.

Bowen Products Corporation, 2760 West Warren Avenue, Detroit, manufacturer of lubricating devices, grease cups, etc., will soon begin work on a one-story and basement addition to cost $30,000, for which general contract has recently been let to M. J. Hoffman Construction Co., 7147 West Warren Avenue.

Edward Goff, Pontiac, Mich., local representative for Cadillac automobile, including Royal Oak and Birmingham districts, has secured property on West Huron Street for a service, repair and sales building, to cost $200,000 with equipment. Work will begin early in spring.

Kurth & Knapp Mfg. Co., Inc., Detroit, fabricator of steel and sheet metal, has moved into its new plant and office at Canfield Avenue and Moran Street.

Canada

TORONTO, Jan. 23.

MACHINE tool business is more active, with sales running mostly to single items which total a good volume. Inquiries are of a diversified nature and come from many sections of the Dominion. Demand from the mining fields of northern Ontario has improved considerably since the first of the year, and there is a steady inquiry for equipment for milling plants, etc. The automotive industry is the chief buyer at present with railroads running a close second, purchasing more extensively for replacement needs and for shops under construction. Improvement among manufacturing interests has been reflected in a stronger demand for small tools.

H. A. Brown, vice-president General Motors of Canada, Ltd., Oshawa, Ont., states that Walkerville plant of corporation, which has been idle four years, will be reopened early in February. Slightly more than one-half capacity will be put into operation as soon as machinery can be installed, major portion to be used for coach and truck division. A complete line of trucks, bus bodies and cabs will be made. Other space will be devoted to manufacture of front axles for Chevrolet and Pontiac cars. It is intended to remove entire manufacturing of General Motors trucks from Oshawa, Ont., to Walkerville, which will provide more room for expansion of other lines at Oshawa works.

Fraser Companies, Ltd., will start work immediately on erection of a $2,000,000 mechanical pulp mill at Edmunston, N. B., which is expected to be in operation by end of year. Enlargement of sulphite mill is already under way. Further official announcements are expected soon respecting establishment of other pulp and paper mills on Restigouche or Miramichi River in New Brunswick.

Corrugated Cattle Cake & Cotton Seed Oil Co., 66 Temperance Street, Toronto, will start work in spring on erection of a factory and mill at Huntsville, Ont., to cost $100,000. It will be two stories, 100 x 310 ft., steel and brick construction. T. Walsh, manager, is receiving bids until Feb. 10 on erection of like plant at Weston, Ont.

Western Canada

Quaker Oats Co. is planning erection of large mill at Saskatoon, Sask., on which work will start in spring.

Construction will start at once on erection of a plant at St. Boniface, Man., for Great West Paper Mills Co., to cost $300,000. Box board and building paper will be produced.

Pacific Coast

SAN FRANCISCO, Jan. 18.

CONTRACT has been let by Austin-Western Road Machinery Co., Los Angeles, to William P. Neill Co., Inc., 4814 Loma Vista Street, for one-story plant in central manufacturing district, 100 x 150 ft., to cost about $40,000 with equipment.

Municipal Power & Light Bureau, South Broadway, Los Angeles, has plans for a new power substation and distributing plant at Venice, Cal., to cost about $220,000, of which approximately $150,000 will be used for equipment. E. F. Scattergood is chief engineer.

Goodrum & Vincent, Santa Monica, Cal., local representatives for Buick automobile, have awarded general contract to H. M. Roth Construction Co., National Building, for a two-story service, repair and sales building, 150 x 150 ft., to cost $160,000 with equipment.

Utah Asphalt Corporation, Price, Utah, care of John F. Cregon, Third Street and North Grand Avenue, Pueblo, Colo., engineer, has plans for a rock asphalt mining plant, including power house, machine shop and other units, to cost $750,000 with machinery.

Washington Gas & Electric Co., Longview, Wash., has arranged for bond issue of $1,250,000, portion of proceeds to be used for extensions in power plant and transmission system.

Pacific Asbestos & Supply Co., 315 Front Street, Portland, has authorized plans for rebuilding portion of plant recently destroyed by fire, with loss reported at $50,000 including equipment.

Valley Motor Co., Salem, Ore., has work under way on a one-story service, repair and garage building, 157 x 220 ft., to cost close to $100,000 with equipment.

Smokeless Fuel Co., Salt Lake City, Utah, is completing plans for construction of first unit of new plant, to cost in excess of $200,000 with equipment. Other units will be built later, with entire cost placed at $1,000,000.

Board of Education, Glendale, Cal., will build vocational shop and power house in connection with new group of eight high school buildings to cost $1,200,000. Alfred F. Priest, Fay Building, Los Angeles, is architect.

Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has applied for permission to construct and operate a hydroelectric power plant on Feather River, Butte, Plumas and Sierra Counties, comprising group of eight generating stations, with gross capacity of 360,000 hp. Entire project with transmission lines will cost in excess of $15,000,000. Company has secured permission to dispose of stock issue of $6,460,000, portion of fund to be used for extensions and improvements.

Sperry Flour Co., 141 California Street, San Francisco, has awarded general contract to C. F. Dinsmore & Son, Ogden, Utah, for new factory branch at Ogden, with storage warehouse, grain tanks, etc., to cost about $250,000, including mechanical handling equipment.

Continental Can Co., with branch works in Seattle, has purchased plant of Seattle-Astoria Iron Works, Seattle. Latter company specialized in manufacture of automatic can-making and canning machinery for food and other dry products. Capital stock of Seattle-Astoria Iron Works was $500,000, and its transfer to Continental Can Co., will be made by an exchange of stock in each company. Continental Can Co. recently purchased Los Angeles Can Co., Los Angeles, G. N. Easton Can Co., San Jose, Cal., and Seattle Can Co., Seattle.

Washington Iron Works, Seattle, founder, machinist and boiler maker, is adding a forge shop to its new plant at Sixth Avenue South and Atlantic Street. It will be 48 x 150 ft. and will cost about $50,000. When completed, equipment will be removed from former forge shop and a new Mahr forging billet heating furnace installed.

Bids are being taken on a $750,000 plant at Cajon Pass for American Portland Cement Co., Story Building, Los Angeles.

Offices of Pacific Coast Steel Co., San Francisco, have been moved from Rialto Building to Hunter-Dulin Building.

United States Steel Products Co. has moved its Portland, Ore., offices to new headquarters at Thirty-third and Nicolai Streets. E. R. Eldridge is manager in this district.

Seattle branch of Allis-Chalmers Mfg. Co., Milwaukee, Rex T. Stafford, manager, has plans for new steel and concrete building, 60 x 150 ft., in which company will manufacture Texrope drive, which it is making in its present shop on leased ground. New plant is to be built on property owned by company. Equipment will include 15-ton electric crane.

Foreign

ARRANGEMENTS are being made by Westphalia United Electric Co., Berlin, Germany, for sale of bond issue of $20,000,000 in United States, under direction of Harris, Forbes & Co., 56 William Street, New York, bankers, proceeds to be used for expansion and improvements in power plants and system.

Company recently formed at Muzquiz, Coahuila, Mexico, has plans for a hydroelectric power project on San Juan River where site has been secured, and it is purposed to award contracts for construction and equipment at an early date. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference Mexico No. 26500; also at American Consulate, Piedras Negras, Mexico, Oscar C. Harper, vice-consul.

Municipal Council at Prague, Czechoslovakia, has plans for construction of a brick-manufacturing plant at Jinonice where property with raw material deposits has been secured. Initial works will have annual output of 30,000,000 brick. Information at office of American Consulate, Prague; K. L. Rankin, assistant trade commissioner.

Government of Colombia, South America, is planning purchase of locomotives, rails, railroad cars, steel barges, concrete mixers, trucks, pipe and other construction equipment for building of railroads, waterways, highways, etc., with such machinery estimated to cost more than $2,500,000. Details at Colombian Government Bureau of Information, 1440 Broadway, New York.

Officials of General Electric Co., Schenectady, N. Y., and Electric Bond & Share Co., 2 Rector Street, New York, have formed Italian Superpower Corporation, an affiliated interest, to take over and develop light and power properties in Italy, including acquisition and expansion of existing hydroelectric properties and other power utilities. Plans are said to be under way for sale of bond issue approximating $30,000,000, considerable portion of proceeds to be used for power expansion and development. L. K. Thorne, president, Bonbright & Co., Inc., 25 Nassau Street, investment securities, will be chairman of board and president of new company.

NEW TRADE PUBLICATIONS

Railroad Equipment.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin No. W P-1000, dealing with railroad products. Included are pumps, air compressors, steam condensers, oil engines, water and oil meters, locomotive feed water heaters and pumps and open stationary feed water heaters.

Alloy Iron and Steel.—International Nickel Co., New York. Three pamphlets, Nos. 11, 203 and 204, have recently been issued, dealing respectively with "Notes on Machining Alloy Steel," "Effect of Nickel on Machinability of Cast Iron" and "Economic Value of Nickel in Cast Iron." The first is by Thomas H. Wickenden, the second by D. M. Houston, and the third is written by another member of the staff of the development and research department of the company. They are all well illustrated.

Pyrometers.—Pyrometer Instrument Co., 74 Reade Street, New York. An eight-page pamphlet describes the simplified pyro optical pyrometer which the company has recently developed.

Facts About Refractory Mortar.—Denver Fire Clay Co., Denver, Colo. Pamphlet discussing the essential properties of mortars for bonding fire brick in furnace and boiler settings. Describes the company's preparations which have high melting point, low changes in volume and strength at heat and good resistance to corrosive agencies.

Steel Castings.—Commercial Steel Casting Co., Marion, Ohio. Illustrated 16-page pamphlet showing various types of open-hearth castings produced and some of the equipment.

Welding and Cutting Equipment.—Torchweld Equipment Co., 224 North Carpenter Street, Chicago. Catalog, 32 pages, 4 x 9 in., illustrating interior construction of oxy-acetylene blowpipes and regulators. Full line of auxiliary equipment is listed and priced.

Design of Furnaces for Pulverized Coal.—Combustion Engineering Corporation, 200 Madison Avenue, New York. 8-page pamphlet emphasizing the necessity of turbulent mixing of fuel with preheated air in order to burn pulverized coal efficiently. Data on wall temperatures and notes on maintenance of boiler settings are also included.

Spectrographic Analysis.—Adam Hilger, Ltd., 24 Rochester Place, Camden Road, London, N. W. 1, England, 10-page pamphlet containing reports from eight different laboratories, citing their ability to detect impurities in metals of the magnitude of 0.001 per cent. Also a list of applications to commercial metallurgical analysis, and a brief description of the necessary equipment.

Worm-Gear Speed Reducers.—W. A. Jones Foundry & Machine Co., 4401 West Roosevelt Road, Chicago. Catalog 35 of 56 pages is devoted to speed-reducing units involving worm gears. Many of the illustrations are from installations used in plants of wide variety. Details of the equipment are shown, together with price lists, clearance diagrams and a large amount of tabular matter indicating sizes to be used for varying conditions.